

**Appendix L**  
**Strategic Environmental Assessment – Environmental Report**

## **NON-TECHNICAL SUMMARY**

### **What is an SMP?**

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 through effective and sustainable shoreline management. A SMP aims to manage risk by using a range of methods which reflect both national and local priorities, to reduce the threat of flooding and erosion to people and their property, as well as benefiting the environment, society and the economy in line with the Government's 'sustainable development principles'.

### **The Wash**

The Wash is the largest estuarine system in the UK and forms a largely shallow marine embayment into which a number of rivers drain before flowing into the North Sea. More land has been reclaimed from The Wash than any other British estuary, with large amounts of swamp and marshland having been reclaimed through drainage and embankment that began in Roman times.

As well as the large-scale sub and intertidal habitats, The Wash has a number of valuable fringing habitats of conservation significance characterised by saline lagoons, low-lying marshes, shingle beaches, dune complexes and farmland. Each of these habitats in turn supports a range of species of high conservation value, including birds, plants and invertebrates. The importance of this area is reflected in the fact that the majority of the coastline is subject to statutory nature conservation and landscape designations, with important implications for The Wash SMP, which covers approximately 105 km of coastline, stretching from Gibraltar Point to Old Hunstanton. Some areas of The Wash are also designated as part of the North Norfolk Coast Area of Outstanding Natural Beauty.

The Wash also contains some of the most productive farmland in the country with over 31,000 hectares of Grade 1 agricultural land. It is estimated that the production of food in the area is worth in the region of £250 million, which contributes significantly to the local economy.

### **Provision of a SEA for the SMP**

The provision of a SEA for SMPs is not a statutory requirement; the driver for SEA provision is Government policy with the intent being to ensure that the process is transparent and has due regard to the coastal environment. Under Directive 2001/42/EC of the European Parliament and European Council on the assessment of the effects of certain plans and programmes on the environment, a Strategic Environmental Assessment (SEA) must be undertaken for plans and programmes that are required by legislative, regulatory or administrative provisions. 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 and therefore are subject to

the SEA process. The SEA provides a systematic appraisal of the potential environmental consequences of high-level decision-making; by addressing strategic level issues, the SEA process shapes the selection of the preferred option. It also directs individual schemes towards the most appropriate solutions and locations as well as helping to ensure that resulting schemes comply with legislation and other environmental requirements.

The SEA is therefore intended to ensure that consideration of the socio-economic and environmental issues relating to the coast have been central in the development and evaluation of policy. Within the SEA process and in a manner analogous to that used throughout the SMP process, the term 'environment' has been used to cover the following receptors (as defined in Environmental Assessment of Plans and Programmes Regulations, SI 1633 2004):

- Population & 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.

### **The Assessment**

The assessment has been provided for the suite of policies contained within the SMP and outlined in **Section 5** of the Environmental Report.

The SEA process has developed two distinct and key documents; a Scoping report and an Environmental report. The Scoping report established an environmental baseline for The Wash coastline and through doing so developed a series of SEA assessment criteria, by which the SMP policies could be assessed. The Scoping report underwent a four week consultation period with The Wash SMP Client Steering Group (itself comprised of statutory consultees, including the appropriate local authorities and government agencies). Following the consultation period and the provision of feedback by the statutory consultees, the environmental assessment of preferred SMP policy was undertaken using the SEA assessment criteria agreed through the consultation period; with this report being the summation of that process. The suite of environmental issues identified and agreed through the Scoping Report on The Wash coast are as follows:

- Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land;

- Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise;
- The loss of designated intertidal habitat located seaward of existing defences due to sea level rise;
- Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types;
- Maintenance of environmental conditions to support biodiversity and the quality of life; and
- Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash.

The methodology used to identify and predict the significant likely environmental effects related to implementing The Wash SMP involved the use of an evidence-based, expert judgement system based on the widely accepted Source-Pathway-Receptor model (SPR). Due to the intricate and multivariate nature of SMPs, the appraisal took the form of a qualitative assessment based on professional judgement and supported by peer-reviewed literature, with the outcomes being scored in seven categories between major positive and major negative. The assessment has been provided at two levels:

- 1) Primary analysis of each Policy Development Zone (PDZ) (detailed assessment); and
- 2) Secondary analysis which seeks to establish the overall effects of all PDZs (the plan as a whole).

The primary analysis was recorded on a series of detailed tables which fully documented the effect of SMP policy in each PDZ with regards to the assessment criteria. A full record of this primary assessment is provided in **Annex I**. An additional assessment is also provided in this report with regards to how SMP policy in specific PDZs has complied with the developed assessment criteria. PDZs where SMP policy has recorded numerous negative decisions (with regard to the assessment criteria) have been discussed on an individual basis, while those which have limited numbers of negative decisions will be discussed under the secondary analysis.

In addition to providing the results of this assessment, the Environmental report also provides monitoring and mitigatory measures to ensure that the effects of the SMP on The Wash coastline are minimised as far as possible. The specification of monitoring and the actions to enact the monitoring requirements will be included within the SMP Action Plan. This approach provides the most robust mechanism for delivery, since the SMP Action Plan is a) directly linked to SMP delivery and b) builds on the organisational roles developed within the SMP process.

## **Conclusions**

A key driver for the development of SMP policy was the provision of a balance between the two contrasting requirements of ensuring the continued defence of established settlements on a fixed coastline, while promoting coastal dynamism and ensuring that areas of The Wash coast which are wild and remote in nature retain this special quality. In a wider context, the maintenance of this balance is dependent upon sediment movement along the coast and the manner in which the coast develops in response to this. In pursuit of the provision of this balance, the SMP has devised a strategic approach to management, which focuses on the holding of locations which are key features / receptors, while enabling the natural evolution of the coast in areas between fixed points. A further complexity has been the need to sustainably manage coastal habitat which has responded to previous coastal management practice. It is in providing this balance that localised conflicts occur. By maintaining the protection of historic settlements and coastal communities, the potential exists for adverse effects on coastal habitat to arise from factors such as coastal squeeze and the limiting of sediment movement along the coast.

On the basis of this SEA, The Wash SMP has been considered to have been successful in providing this balance; only three significant adverse effects were identified, with the majority of the remaining effects being either minor positive or neutral. Of the PDZs which have been assessed as having a minor adverse effect, mitigation measures have been provided in the following section to offset these effects. The SMP can therefore be concluded to have provided a range of positive benefits to the environment and where minor negative effects have been identified, mitigation has been devised to address these effects.

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## L1 INTRODUCTION AND BACKGROUND

### L1.1 The Wash Shoreline Management Plan (SMP)

This report is the Strategic Environmental Assessment (SEA) Environmental Report (ER) for the second Wash Shoreline Management Plan (SMP). The Wash SMP2 runs from Gibraltar Point to Old Hunstanton and covers approximately 105 km of coastline.

### L1.2 The SMP context for the SEA

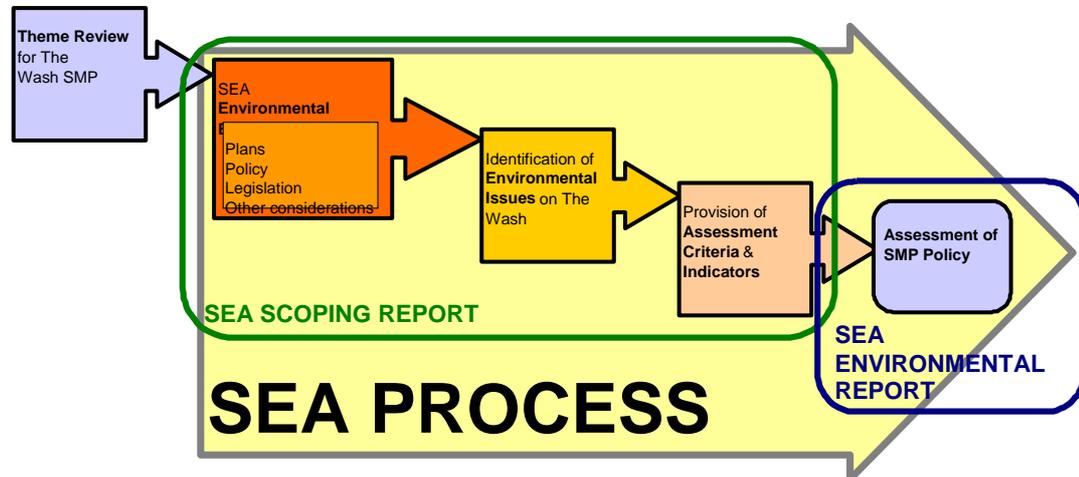
The SEA process to accompany the production of the SMP is intended to ensure that consideration of the environmental issues relating to the coast is central to the development and evaluation of policy. This **Environmental Report** provides the mechanism to support a structured evaluation of the environmental issues relating to The Wash based on the use of the assessment criteria which were developed within the **Scoping Report**. Within this SEA Environmental Report, the preceding Scoping Report and in a manner analogous to that used throughout the SMP process (Defra, 2006) the term environment is used to cover the following **receptors** (as defined by the SEA Regulations - SI 1633):

#### RECEPTORS

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

The role of this report within the SMP SEA 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 (*i.e.* plans, policies and programmes). By addressing strategic level issues, SEA aids the selection of the preferred options, directs individual schemes towards the most appropriate solutions and locations and helps to ensure that resulting schemes comply with legislation and other environmental requirements.

Under Directive 2001/42/EC of the European Parliament and European Council on the assessment of the effects of certain plans and programmes on the environment, a SEA must be undertaken for plans and programmes that are required by legislative, regulatory or administrative provisions. 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, although it must be noted that SEA is not a statutory requirement for SMPs and that this is therefore not a statutory document.

The Defra SMP guidance (Defra, 2006) states that the environmental effects of all policies must be considered before deciding which policies will be adopted. Consideration should be 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. As a result Defra has recommended that assessment of SMP policies using the approach described in the Directive is adopted. The legislative act which transposes the Directive into domestic law is the Environmental Assessment of Plans and Programmes Regulations (SI 1633, 2004). The main aim of the EU Directive is to *"provide for a high level of protection of the environment and to contribute to the integration of*

*environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development<sup>8</sup>.*

This document represents the second stage in the process of providing an SEA for The Wash SMP, with the third and final stage being the provision of a post-adoption statement.

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

- 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; and
- ODPM (2005). A Practical guide to the SEA Directive.

#### **L1.4 Scope and structure of this report**

This report comprises eight sections and four annexes, of which this introduction forms **Section One**.

The purpose of this report is to build on the content and findings of the **Scoping Report** and clearly express the manner in which the SMP is likely to affect the key environmental issues and associated receptors on The Wash coast.

The sections within this SEA environmental report are as follows:

**Section One** introduces this document and sets the context for the use of SEA within the SMP process. In addition, this section explains 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 derived assessment criteria;

**Section Five** presents the assessment of the SMP at a PDZ 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 details of the next steps to be taken in the SEA process including details for consultation;

**Section Eight** provides the references for the study;

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

**Annex II** presents a summary of consultation responses;

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

**Annex IV** provides a copy of the SEA Scoping Study.

## 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 were produced for the coastline of England and Wales in the late 1990s and were based on sediment cell boundaries which related to the movement of sand and shingle along the coast. The boundaries of these cells were originally set at locations where the net 'along shore' movement of sand and shingle changed direction. In some instances, the area covered by an SMP differed from these sediment cell boundaries, due to different requirements, such as the area covered by a coastal authority. However, for the SMP reviews a behavioural systems<sup>1</sup> approach was recommended, leading to slightly different boundaries compared to the first generation (Defra, 2006).

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

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

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

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<sup>1</sup> The current program of SMPs around the coast is a review of the first generation of reports produced in the 1990s and reflects the availability of new coastal processes information, new considerations (site designations etc) and less uncertainty about climate change.

**Table 1.1 Options used in SMP development**

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

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

#### L1.5.2 Implications of SMP policy on the wider environment

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

**Table 1.2 Potential generic implications of each SMP option**

<b>SMP 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 &amp; 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 &amp; boreholes);</li> <li>• Protects economic assets located behind defences; and</li> <li>• Provides protection to ecological, cultural and historical assets</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>

SMP option	Positive impacts	Negative impacts
	landward of the defences.	
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>
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 SMP policy on environmental receptors

Defra SEA guidance (Defra, 2004) identifies a series of environmental receptors, which should form the initial basis and scope of the SEA. The

receptors are the environmental features which may be impacted by the effects of the SMP.

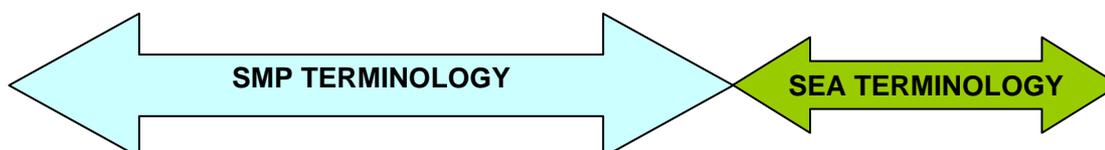
The SMP guidance requires that the SMP is developed in response to a consideration of the environmental features of the coast, features which need to be assessed to determine the nature and characterisation of the coast. There is a difference of language here between the building block of the SEA and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

According to SEA Regulations, each environmental receptor requires an initial appraisal to examine the potential impacts of the SMP. This is provided in **Annex III**. A summary of the overall potential effects of the SMP on the environment is provided in **Table 1.3** below. The receptors developed for the Wash SMP SEA have been aggregated from the receptors specified in the SEA guidance. The intent being to ensure that the development of the SMP and the role of the SEA in policy assessment and development, is provided in regard to a consistent set of criteria which is based upon both SMP and SEA guidance.

The specific requirements of the SMP process however, do necessitate a considered approach to the identification of issues and receptors in order to provide a common and consistent language and basis for assessment. For example, due to the nature of the SMP process and its application across the coast; hence, biodiversity, fauna and flora has been separated into two receptors, habitats and species, as the assessment of impacts upon these receptors can be better quantified by this division.

**Table 1.3 SMP and SEA Terminology**

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



Collectively, the impacts on receptors can then be traced back, to establish how the SMP may influence the issues, objectives of the themes within the SMP. This step provides clarity relating to how the environment has been a consideration in SMP production and assessed in the context of the SEA.

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. Air has been scoped out as a receptor potentially effected by the SMP, since no pathway was identified for this effect. SMP policy concerns itself with land, water and the tidal interface as a spatial area, no instances were identified were SMP policy could have any impact, positive or negative on air quality.

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

## L1.6 SMP Consultation

In addition to the consultation for the SEA, The Wash SMP has followed the procedures for guidance specified in the SMP guidance. A full account of the consultation provided and the responses to feedback is provided in **Annex II** of the SMP

## 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 National Environment Assessment Service (NEAS)) between the 13<sup>th</sup> January and 10<sup>th</sup> February 2009, during which the consultees listed below were invited to provide comments on the environmental baseline and the assessment criteria.

### CONSULTEES FOR THE SEA SCOPING REPORT

- Environment Agency;
- Natural England;
- English Heritage;
- Boston Borough District Council;
- South Holland District Council; and
- King's Lynn and West Norfolk District Council.

### QUESTIONS POSED DURING THE CONSULTATION PERIOD ON THE SEA SCOPING REPORT

1. Has the **Scoping Report** correctly identified the environmental issues on The Wash? (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?

Feedback was obtained from the Environment Agency, Natural England and from English Heritage. The feedback provided mirrored the comments previously received which focussed on ensuring that the assessment criteria were more specific to:

- The range of designated sites and habitat under UK and environmental legislation; and
- The range of heritage features which should form the basis of any assessment.

The changes to the assessment criteria have been included in this report, and ensure that ecological and heritage based features are assessed in the appropriate manner to a consistent level of detail.

In addition to this consultation, this process has also heavily involved the National Environmental Assessment Service (NEAS), an arm of the Environment Agency, who have shaped the assessment. The changes to the assessment criteria resulting from consultation have been included in this report and ensure that ecological and heritage based features are assessed in the appropriate manner to a consistent level of detail. In addition, the consultation process provided the opportunity to scope out certain SEA receptors which were deemed as not being pertinent to the assessment of SMP policy. The receptors defined in SI 1633, but scoped out of this assessment were therefore:

- Climatic factors; and
- Air.

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 will form a component of the wider assessment mechanisms for the SMP which also includes:

- 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).

As a component of the **Environmental Report**, monitoring measures will be specified post-assessment. The actual specification of monitoring and the actions to enact the monitoring requirements will be included in the SMP Action Plan (discussed below).

## L1.9 Evaluation of the plan and alternatives

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 Wash is driven by its geological make-up and it is therefore evident that not one aspect of the coastal (in terms of its physical behaviour, natural or built) environment dominates. There is a complex interdependence between different values along this linear coast, which, put simply means that a decision taken within one SMP management area has the potential to affect multiple adjacent policy units.

As a result, if SMP policy at each management area was to be assessed individually and in-combination, then there would be a multiplier effect along the coastline such that each management unit 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 (of which there are 4) being assessed 32 times, resulting in a total of 128 assessments. With respect to this, it was therefore considered inappropriate and unmanageable for a simple and rigid procedure of policy appraisal to be applied to each SMP option. Further rationale for this decision was based upon the fact that in many management areas, only a limited number of policy options is actually appropriate; for example, a policy of managed realignment would be wholly inappropriate for a heavily populated conurbation, as would a policy of advance the line on a dynamic and natural shoreline. As such, the assessment of each SMP policy option for each management area was deemed too unwieldy and therefore unnecessary within the context of a SMP, especially when the “spirit of SEA” was applied throughout policy development.

The key factor here 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 simple SEA based assessment, the SMP nevertheless provides a rigorous and robust consideration of the feasible options for management. This process - the options appraisal exercise within the SMP, provides a clear account of how options been evaluated and should be sourced for an understanding of how policy has developed.

## L2 CONTEXT AND METHODOLOGY

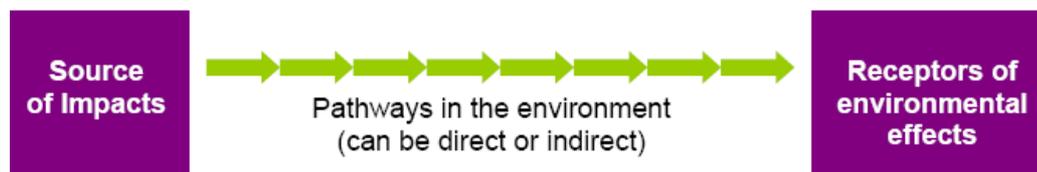
The SEA process is clearly defined in the SEA Regulations and guidance suite. The basic process follows the provision of a **Scoping Report (Annex IV)** which included the environmental baseline, identified key environmental issues, outlined the methodology to be used and offered a series of assessment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

Following consultation on the Scoping Report and the development and assessment of SMP policy, this report will detail and record the actual assessment of the preferred policy option. Subsequent to this, a **Post Adoption Statement** will be provided which will explain how environmental considerations have been taken into account and 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 we will use to identify and predict the likely significant environmental effects of implementing the plan is described below. To assess the environmental effects of implementing the SMP, we will adopt an evidence based, expert judgement system. This approach is based on the widely accepted Source-Pathway-Receptor model (SPR) (**Figure 2.1**).

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



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

- Value and sensitivity of the receptors;
- Is the effect permanent / temporary;
- Is the effect positive / negative;
- Is the effect probable / improbable;
- Is the effect frequent / rare;
- Is the effect direct / indirect; 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 significant positive impact on the environment.
	SMP policy is likely to have a positive or minor positive impact on the environment (dependant on scheme specifics at implementation).
	SMP policy is likely to have a neutral or negligible effect on the environment.
	SMP policy is likely to have a negative or minor negative impact on the environment (dependant on scheme specifics at implementation).
	SMP policy is likely to have a significant negative impact on the environment.
	The relationship between the SMP policy and the environment is unknown or unquantifiable.
	The assessment criterion is not applicable to the SMP policy.

This assessment is based on available information and has regard to the relatively abstract nature of SMP policy (in comparison to scheme level data). The receptors are specified in the SEA Practical Guidance (ODPM, 2006) and are listed in **Table 1.3**.

The use of appropriate receptors is considered in the development of assessment criteria (presented in **Annex I**), whereby the manner in which each receptor (in response to the environmental issues of The Wash) is affected by the SMP is clearly described. Where gaps in knowledge exists (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.

## **L2.2 Development of SEA assessment areas**

The assessment is being provided at the Policy Development Zone (PDZ) level. PDZs within the SMP are defined according to coastal processes and provide a series of policies for a spatial area. PDZs are the building blocks of the SMP and it is considered therefore that the SEA should provide an assessment at this level.

The coast is divided up into four PDZs which are as follows:

- PDZ1 (Gibraltar Point to Wolferton Creek);
- PDZ2 (Wolferton Creek to South Hunstanton);
- PDZ3 (Hunstanton Town); and
- PDZ4 (Hunstanton Cliffs).

The development of policy within this SMP has been devised in response to a consideration of the environmental, social and economic features on the coast and of the coastal processes and systems which shape the coast.

This breakdown enables the assessment to consider policy as an intent of management for areas of coast intended to address the objectives contained within the SMP. An assessment at any other level would not provide an appropriate mechanism to consider how SMP policy will impact upon the environmental issues in The Wash.

### **L2.3 Mitigation and monitoring**

Any mitigation measures or monitoring which are required as a result of this assessment will be clearly specified and listed in this report and ultimately 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 Wash Shoreline Management Plan (SMP) study area encompasses approximately 105 km of coastline, stretching from Gibraltar Point (Ordnance Survey Grid Reference TF 549 574) to Old Hunstanton (Ordnance Survey Grid Reference TM 555 936) and is presented in **Figure 3.1**.

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 Wash is provided in this section and offers a reference point within this report to the factors which have shaped the form and content of the assessment.

The primary area included within this study is defined as the area lying within the main roads which encircle The Wash including; to the west of The Wash the A52 and A16; to the south of The Wash the A17; and to the east of The Wash the A149. These main roads tend to follow the more significant settlements surrounding The Wash, although this does have the disadvantage of major settlements (e.g. Boston, Kirton) being divided by the boundary, it represents a clear and pragmatic boundary within which focussed assessment of features has been undertaken.

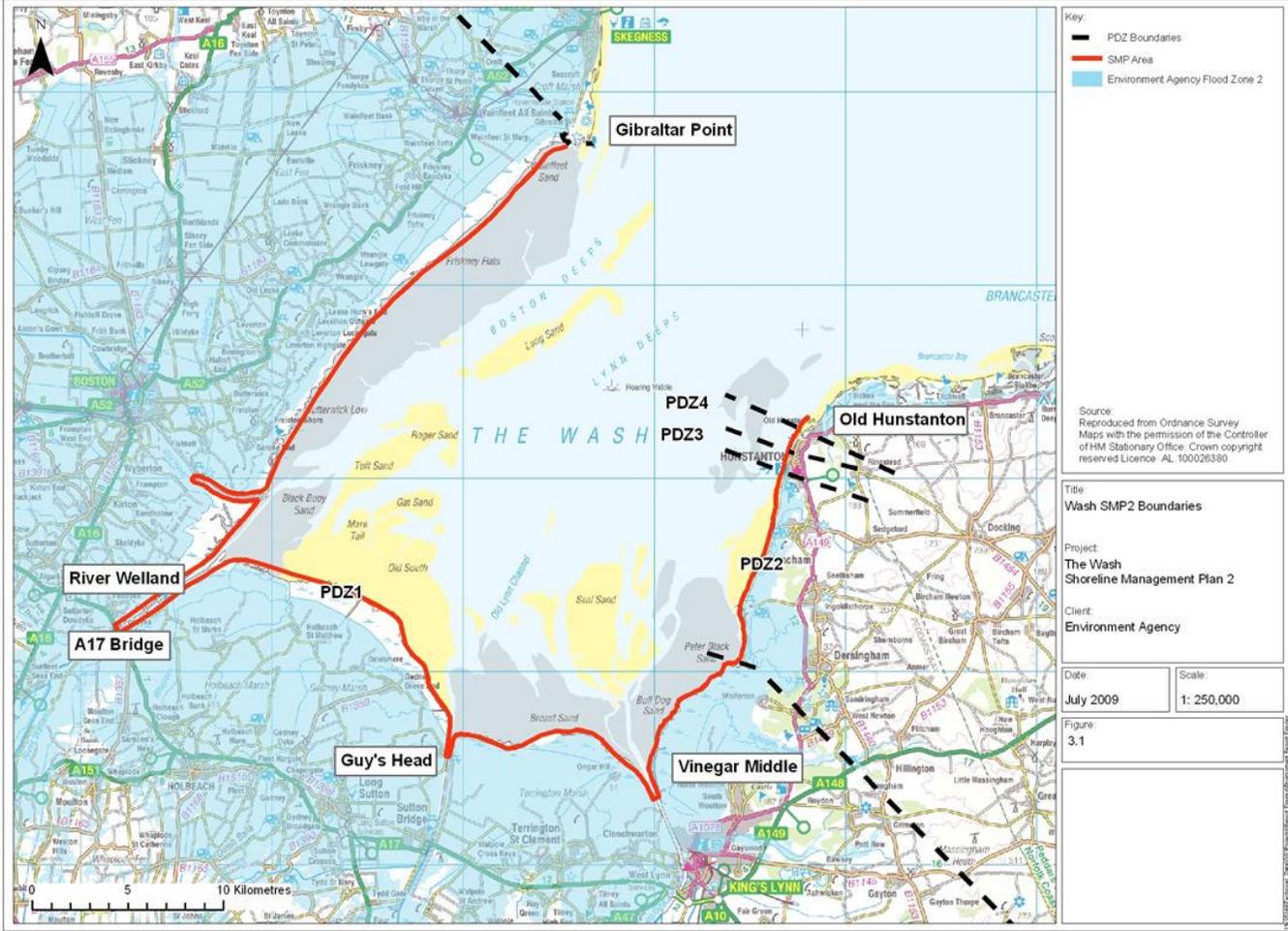
#### L3.2 Landscape

The Wash is the largest estuarine system in the UK and forms a largely shallow marine embayment into which the Rivers Ouse, Welland, Witham and Great Ouse drain before flowing into the North Sea. Marine processes dominate the physical and biological character of the site. As well as its large-scale sub and intertidal habitats, The Wash has a number of valuable fringing habitats of conservation significance including saline lagoons, shingle structures and dune complexes.

More land has been reclaimed from The Wash than any other British estuary with large amounts of swamp and marshland having been reclaimed through drainage and embankment that began in Roman times. It is estimated that in the region of 82,000 hectares of land has been claimed from The Wash since Saxon times.

Part of The Wash SMP study area is included within the North Norfolk Coast Area of Outstanding Natural Beauty (AONB), which was designated in March 1968 and covers a total of 450 km<sup>2</sup> (Norfolk Coast Partnership AONB, 2004). Stretching from King's Lynn to Bacton, the AONB includes the remote coastal marshes of the North Norfolk Heritage Coast which comprises of a varied landscape of mud and sand flats, shingle, dunes, reedbeds, saltmarsh and grazing land.

Figure 3.1 Wash SMP2 Boundaries



### L3.2.1 Soil and agricultural land quality

The soils within the SMP SEA study area are primarily well draining loamy-sands. The western part of the study area tends to feature shallow loamy and sandy soils which become more clayey moving eastwards, while mid-catchment, the loamy soils have less permeable sub-soils and are prone to seasonal waterlogging.

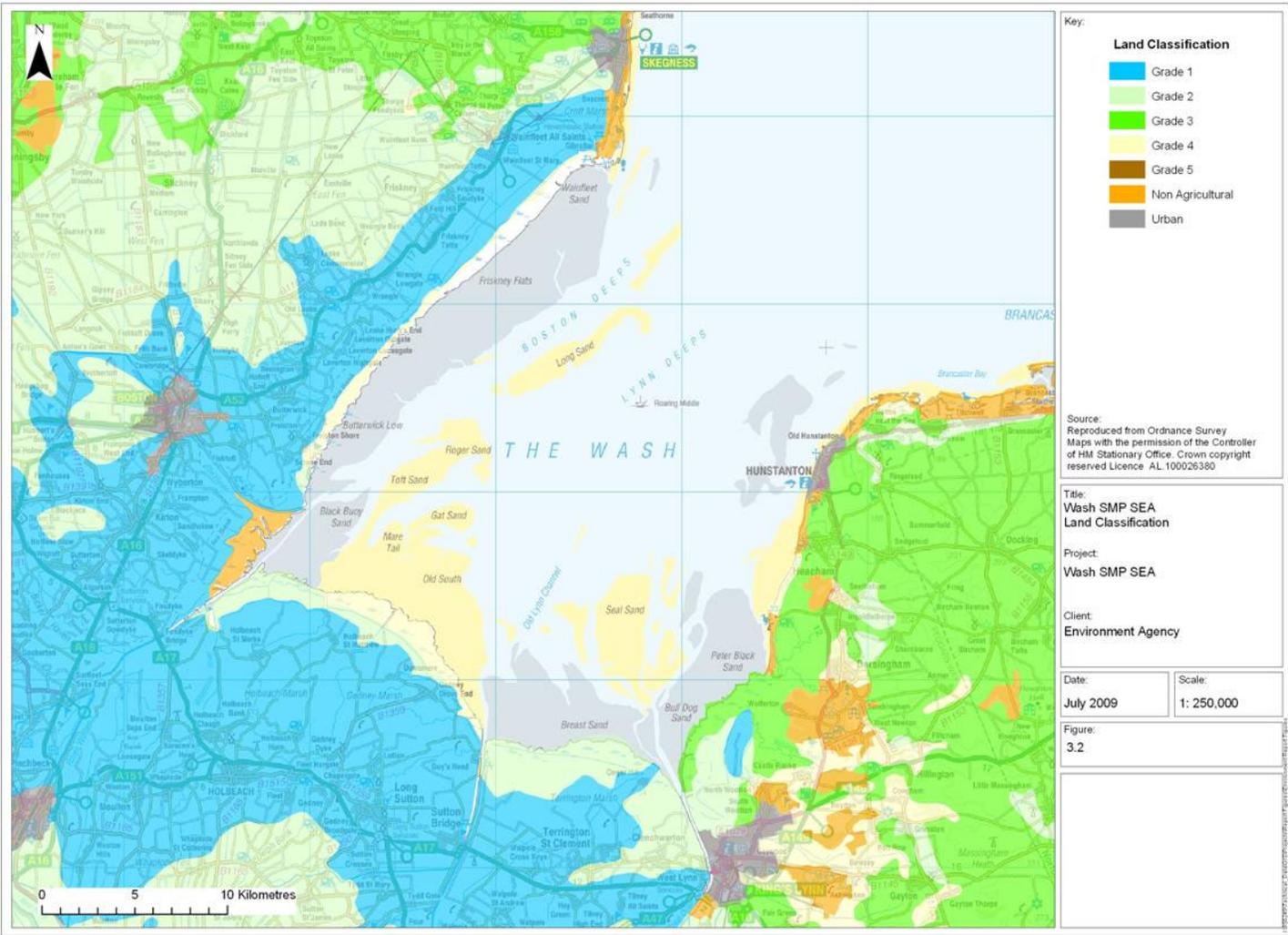
The land within the SMP SEA study area is heavily used for agriculture, with Lincolnshire being more dependent on agriculture than any other county in the UK. It is estimated that the production of food in the county is worth in the region of £250 million (WESG, 2004). The farmland on the landward side of The Wash sea banks is some of the most productive anywhere, with the highest concentration of Grade 1 agricultural land in the country (WESG, 2004). Between Gibraltar Point and the River Nene, the land is predominantly Grade 1, dropping to Grade 2 on the Norfolk side of The Wash.

A substantial amount of Grade 1 and Grade 2 land is at risk from flooding within the area covered by this SMP. There are a total of 354,644 hectares of Grade 1 and 1,849,258 hectares of Grade 2 agricultural land in England, with the area within the scope of this SMP being presented in **Table 3.1** and **Figure 3.2**.

**Table 3.1 Quantification of land classification within the 1 in 1000 year flood zone for The Wash SMP SEA study area**

Land Grade	Area in hectares	Percentage of England's total
Grade 1	31,717	8.9%
Grade 2	6,550	0.34%

Figure 3.2 Wash SMP SEA Land Classification



### L3.2.2 Designated shellfish waters

The Wash was overfished in the late 1970s and 1980s which resulted in the collapse of shellfisheries stocks in the 1990s. Stocks have started to show signs of recovery in recent years, following immediate action from various stakeholders to protect the internationally important wildlife of the site (WESG, 2004).

There are two shellfish areas in The Wash which are designated under the Shellfish Waters Directive (2006/113/EC), details of which are shown in **Table 3.2**.

**Table 3.2 Designated shellfish areas in The Wash (Royal Haskoning, 2009)**

Production area	Species	
	Latin name	Common name
Boston	<i>Mytilus</i> spp	Mussels
	<i>Cerastoderma edule</i>	Common cockle
King's Lynn	<i>Mytilus</i> spp	Mussels
	<i>Cerastoderma edule</i>	Common cockle
	<i>Ensis</i> spp	Razor clams

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 the shellfisheries in the embayment is a responsibility to be shared by all plans and policies to maintain the environmental quality of the area, including the SMP (WESG, 2004).

### L3.3 The Historic Environment

There are 120 Scheduled Monuments (SMs) in the West Norfolk and King's Lynn District Council administrative area and 478 in Lincolnshire. Of these, five in King's Lynn and West Norfolk District and 74 in Lincolnshire are cited by English Heritage (English Heritage, 2009) as being at risk from neglect, decay and pressure from development. Although protected by law, Scheduled Monuments are threatened by a wide range of human activities and natural processes. SMs within the study area are presented in **Table 3.3** and **Figures 3.3 – 3.6**.

The historic environment does however contain a wider range of features than designated sites and buildings. These additional features have been addressed in the Rapid Coastal Zone Assessment (RCZA) which was used during policy production of the SMP. A key source in the provision of the data to support this assessment has been the RCZA (Norfolk Archaeological Unit, 2005; English Heritage, 2007) and the RCZA Update. Three features were marked as being of high value and at high risk, including brick and timber posts indicative of earlier structures dating from 16<sup>th</sup> – 19<sup>th</sup> Century, a wreck called Queen Alexandra, and peat and clay potentially containing preserved human artefacts or evidence of human activity. Further features of significance within the study area are limited.

The information provided here is a summary of the key heritage features.

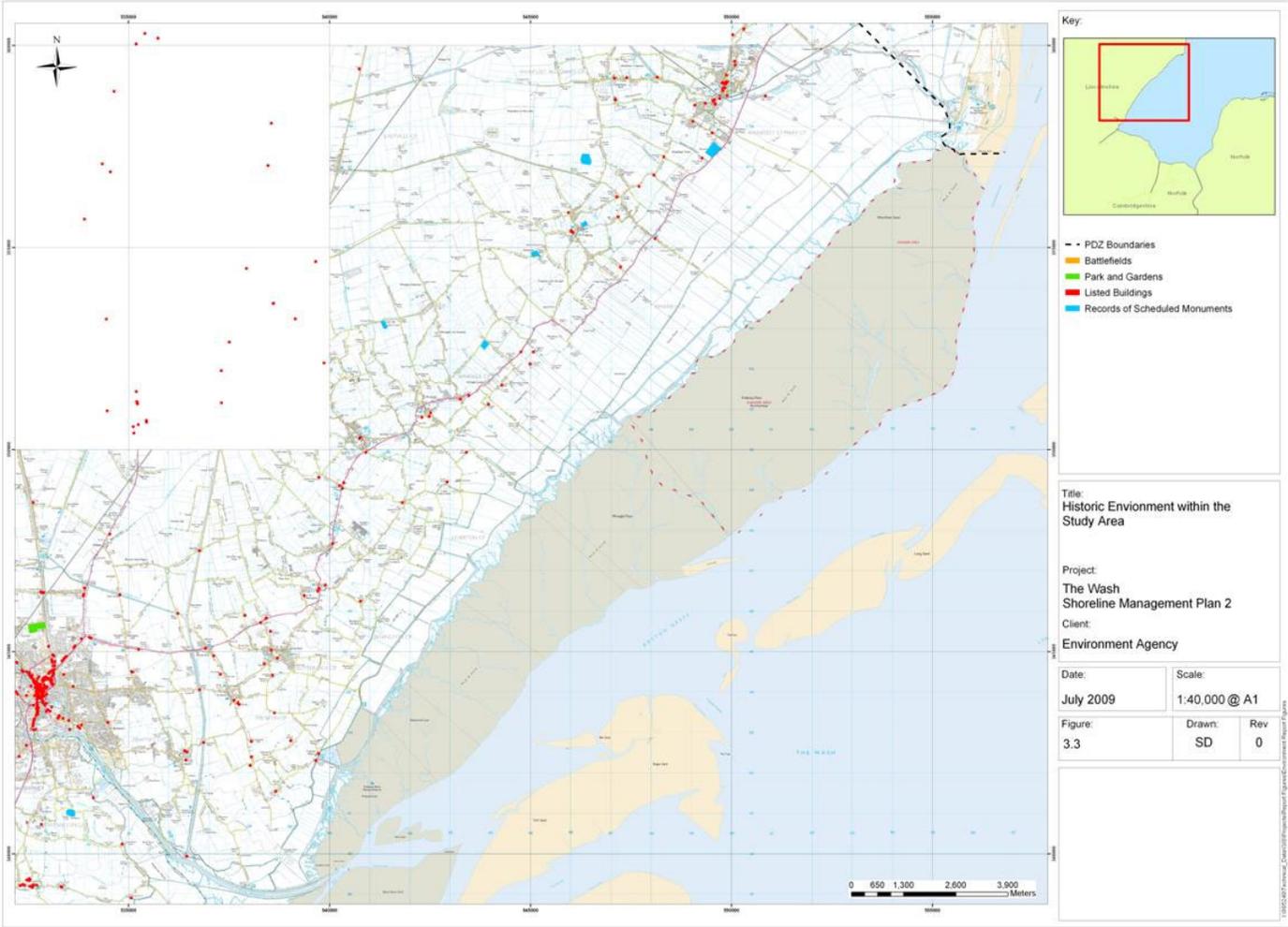
**Table 3.3 Scheduled Monuments within the 1 in 1000 year flood zone (MAGIC, 2008)**

Scheduled Monument Number	Name / Description	Easting	Northing	Area (Ha)
31609	Wyberts Castle, medieval moated site	533565.529526	341010.611268	3.3
22673	Churchyard cross, All Saints churchyard	531511.55599	333306.402847	0.001
22671	Churchyard cross, St James' churchyard	537631.70527	343792.338781	0.001
31121	Cross in St Margaret's churchyard	558926.736827	320196.762281	0.001
NF404	Remains of tower on Lodge Hill	566825.857119	333859.06668	
31610	Multon Hall moated site	533901.404458	337939.008037	4.3
31625	Hussey Tower	533084.626	343631.5105	0.007
20823	Medieval settlement remains North of Kenwick Farm House	556969.817053	319042.449327	2.2

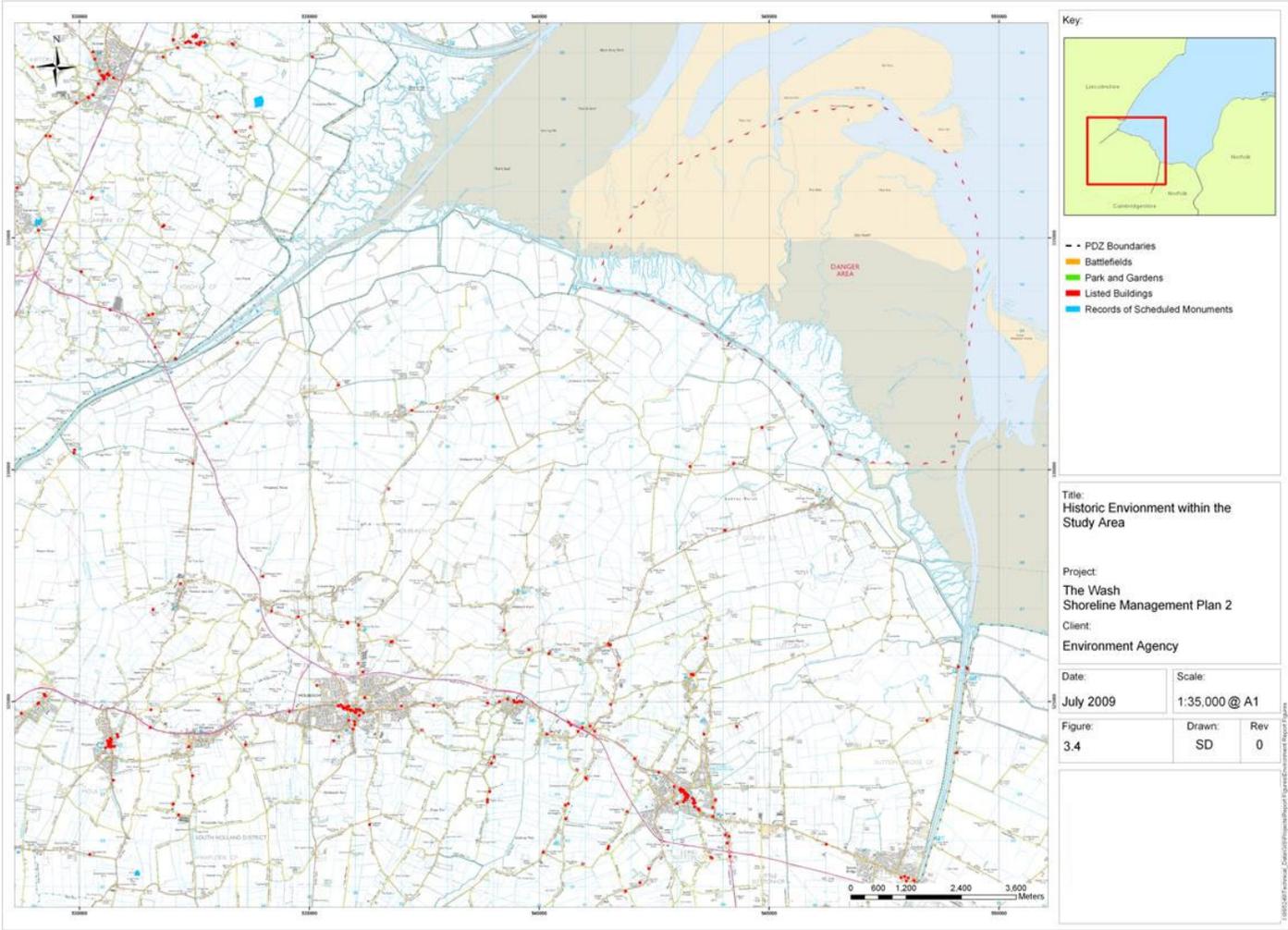
**Table 3.4 Conservation areas along the Wash SMP SEA study area and lying wholly or partially within the study area.**

District Council	Conservation areas within the SMP study area
<b>East Lyndsey District Council (17 in total)</b>	<b>None</b>
<b>Boston Borough Council (11 in total)</b>	<b>Boston Town</b>
	<b>Boston Skirbeck</b>
	<b>Boston Spilsby Road</b>
	<b>Frampton</b>
	<b>Kirton</b>
<b>South Holland District Council (13 in total)</b>	<b>Wrangle</b>
	<b>Gedney Dawsmere</b>
	<b>Fleet Hargate</b>
<b>King's Lynn &amp; West Norfolk District Council (42 in total)</b>	<b>Heacham</b>

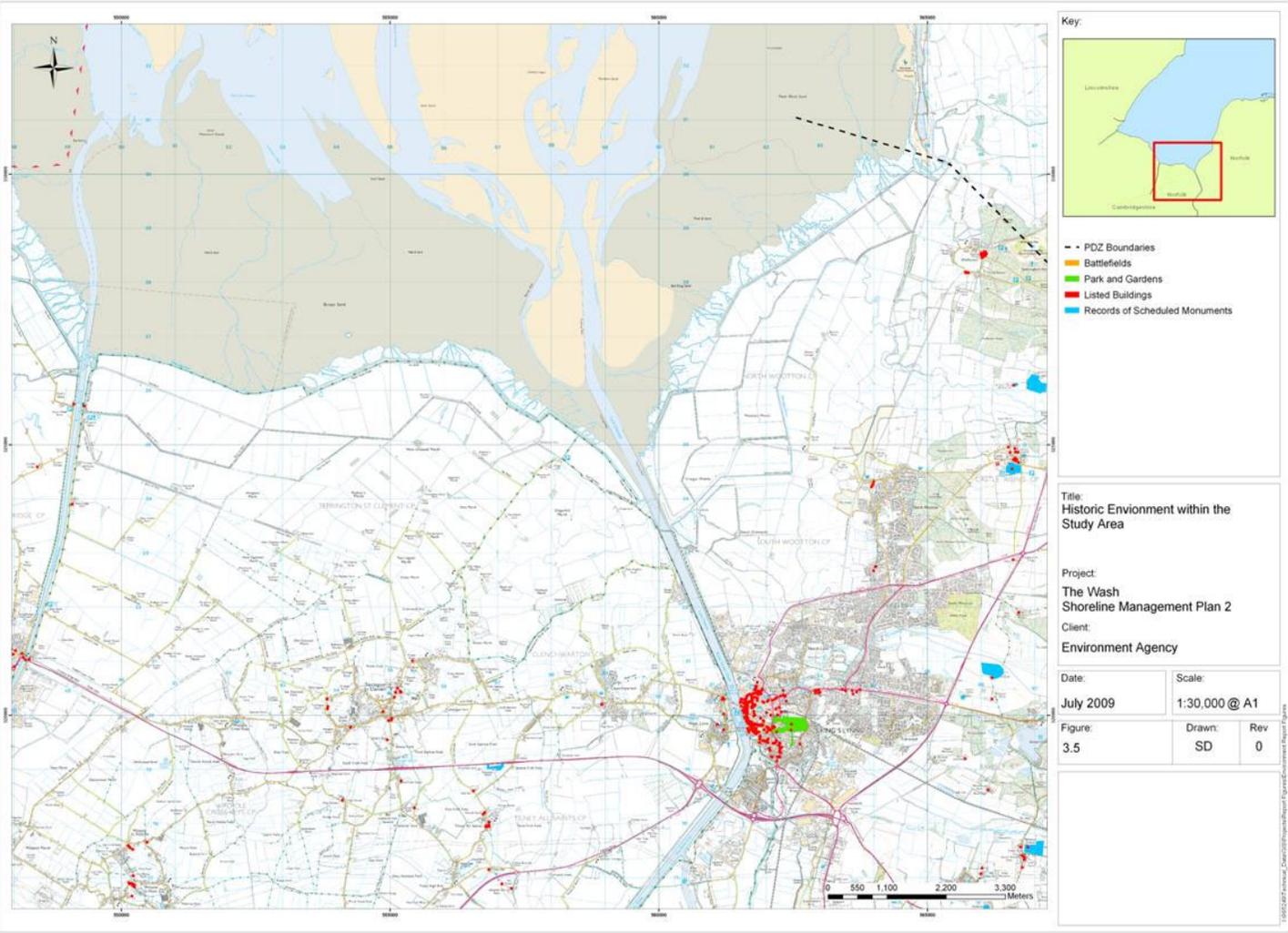
**Figure 3.3 Historic Environment within the Study Area**



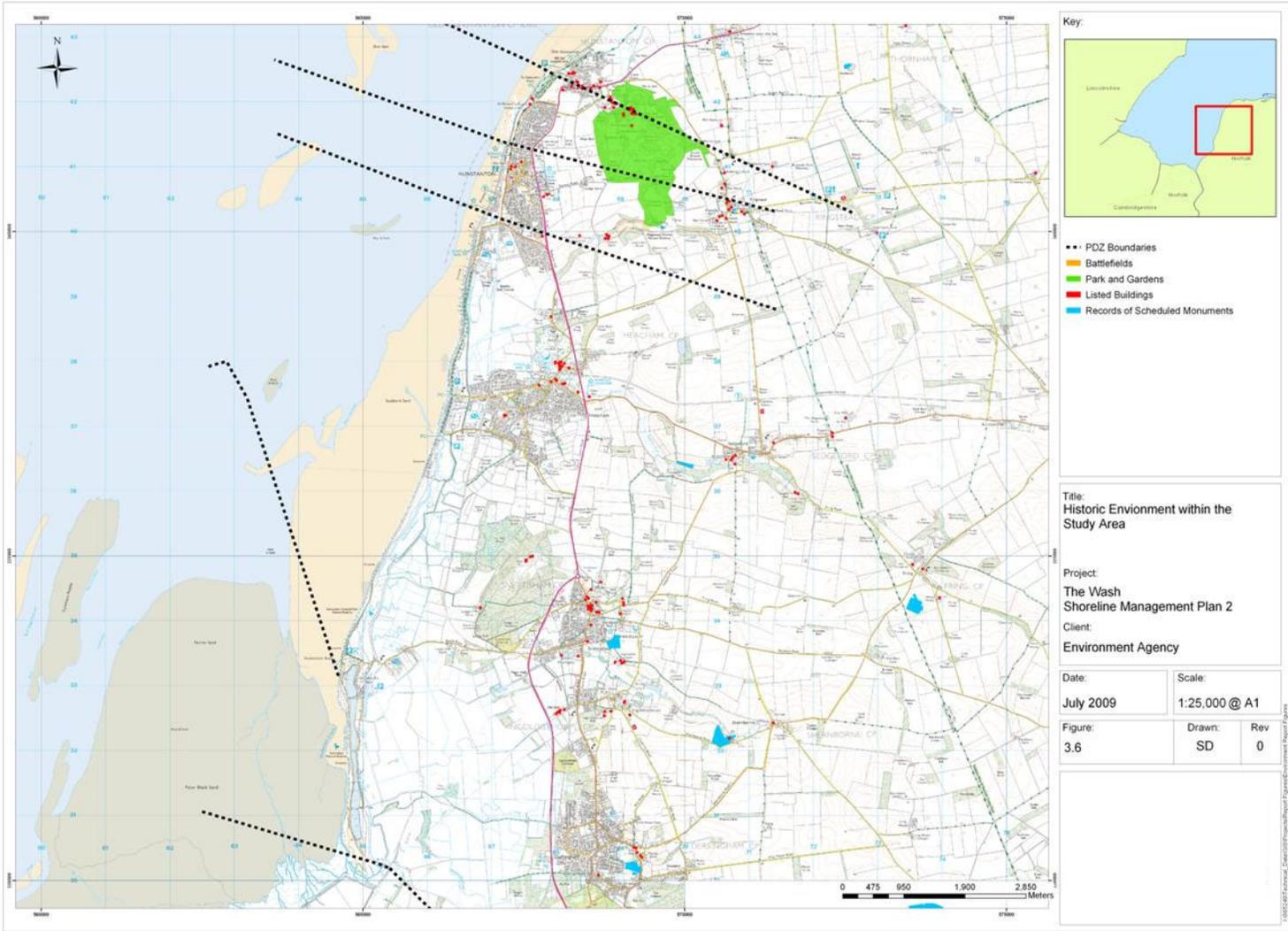
**Figure 3.4 Historic Environment within the Study Area**



**Figure 3.5 Historic Environment within the Study Area**



**Figure 3.6 Historic Environment within the Study Area**



## L3.4 Habitats & species

### L3.4.1 Statutory International Designations

The Wash is the UK's largest embayment and is typified by large areas of intertidal habitat (saltmarsh and mudflat) in a sediment rich system with marine sandbanks and biogenic reef habitat. The Wash is one of the most significant areas in Europe for assemblages of birds which benefit from both the extensive areas of habitat and also the relative remoteness of the area.

Nature conservation designations seek to conserve areas of conservation importance and the habitats and species which are the basis of their statutory designation. However, as the designations are derived from discrete and different pieces of legislation, each therefore varies in the nature and mechanisms of their protection. The inherently dynamic nature of coastal environments and the potential of flood risk management structures and practices to both constrain (e.g. by holding or advancing the line) and create (e.g. from no active intervention or managed realignment) habitat ensures that SMP policy has a highly significant bearing on both natural habitats and designated sites. All internationally designated sites (**Figure 3.7**) within the study area (either coastal or within the 1 in 1000 year coastal flood zone) are presented in **Table 3.5**.

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

International site type	Legislation site designated under	Site name	Area (ha)
Ramsar	Ramsar Convention	North Norfolk Coast	7862
		The Wash	62211
		Gibraltar Point	414
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)	The Wash & North Norfolk Coast	107761
		North Norfolk Coast	3208
		Saltfleetby-Theedlethorpe Dunes & Gibraltar Point SAC	968
Special Protection Area (SPA)	Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive)	The Wash	62211
		North Norfolk Coast	7887
		Gibraltar Point	422

#### L3.4.2 Statutory National Designations

The Wash coastline and surrounding hinterland that form the study area also contains several sites designated under national legislation (**Figure 3.8**), with these being presented in **Table 3.6**.

**Table 3.6 Sites designated under national conservation legislation for the Wash study area (Sites of Special Scientific Interest)**

<b>SSSI name</b>	<b>Area (ha)</b>
Gibraltar Point	598
The Wash	62045
Dersingham Bog	159
<b>NNR name</b>	<b>Area (ha)</b>
Dersingham Bog	159
The Wash	8881
Gibraltar Point	667

Figure 3.7 Wash SMP SEA Internationally Designated Sites

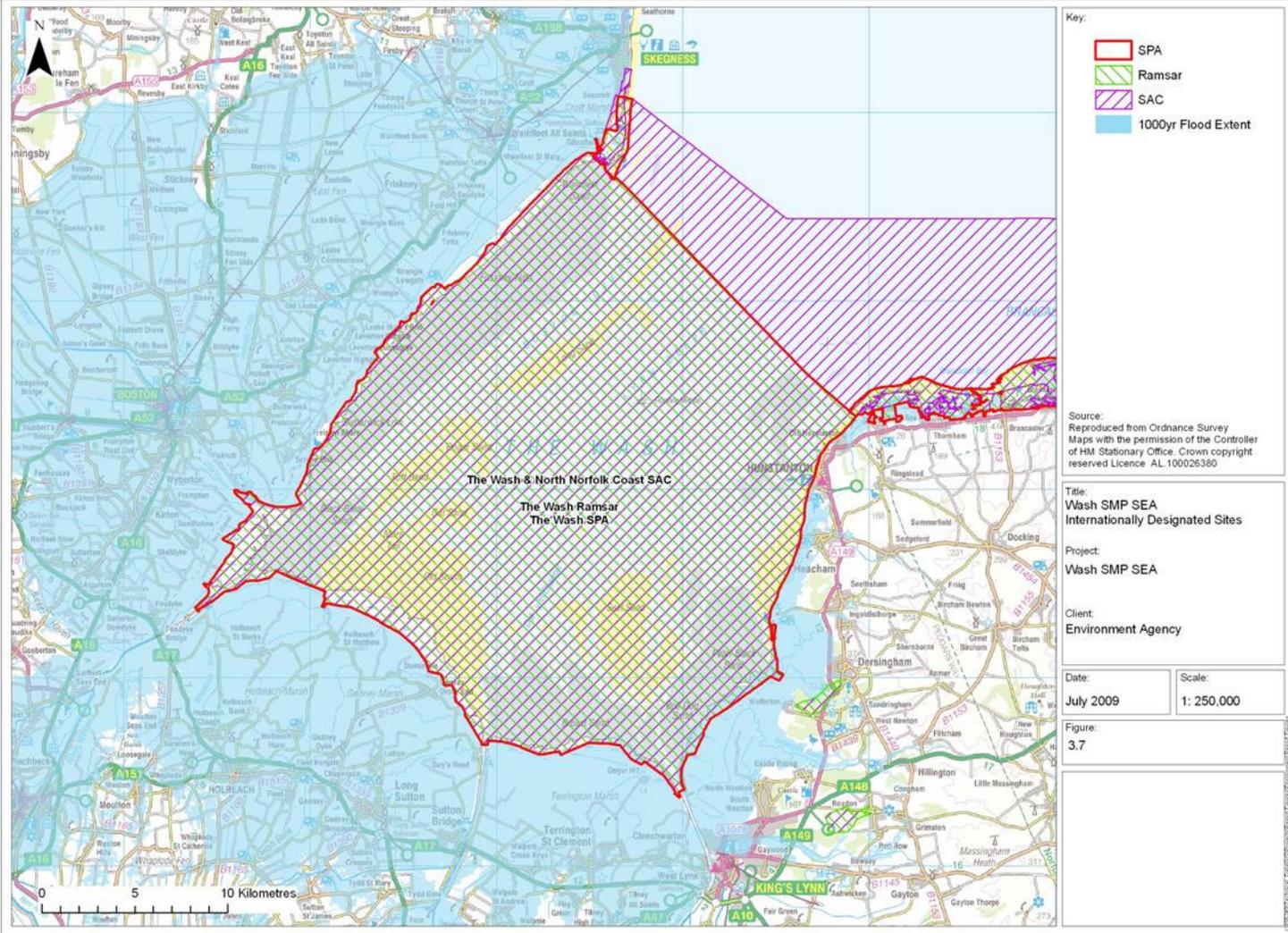
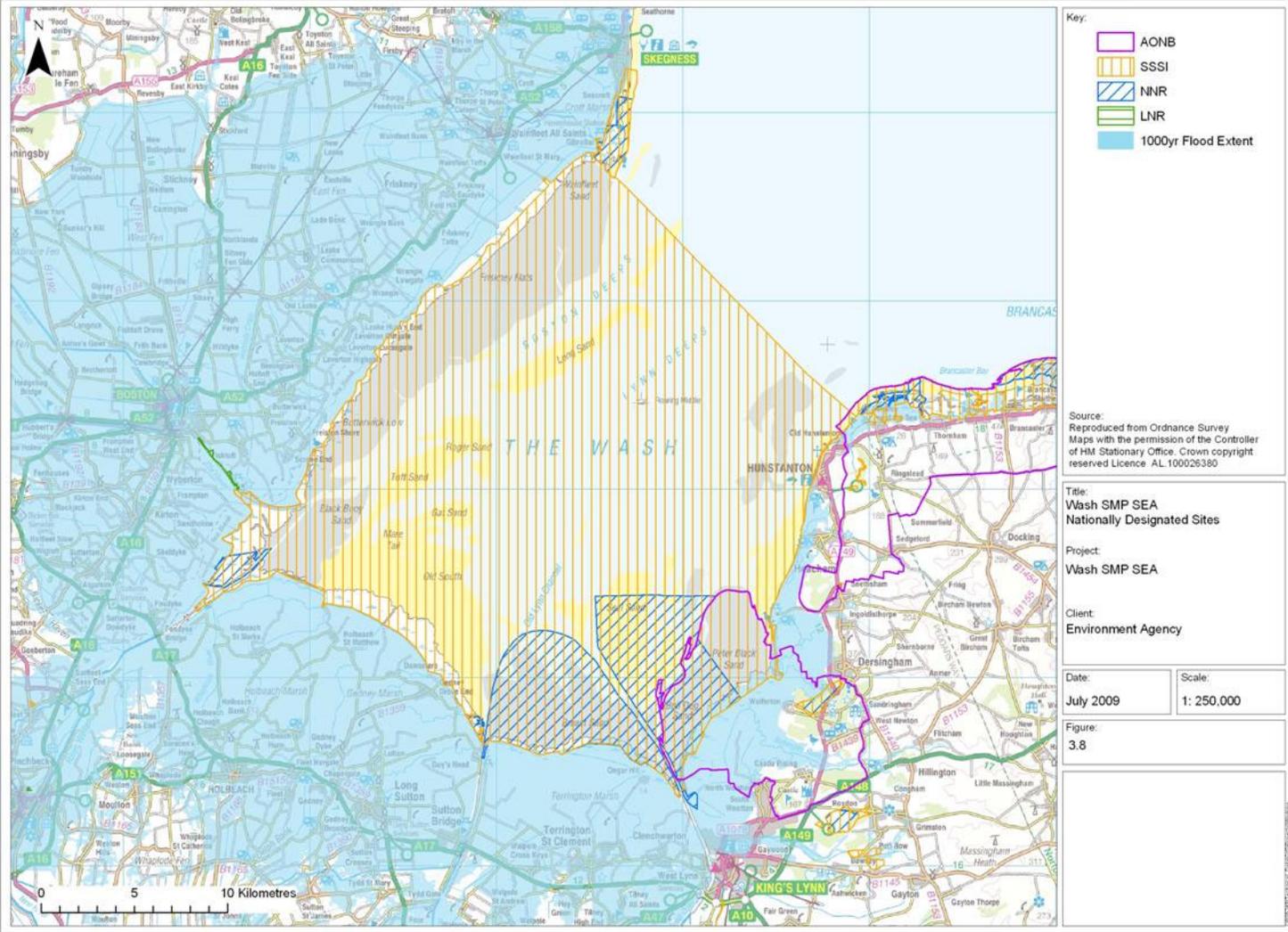


Figure 3.8 Wash SMP SEA Nationally Designated Sites



### L3.5 Key tourism features

Key tourism features within The Wash SMP SEA study area are listed in **Table 3.7**.

**Table 3.7 Key tourism features along the Suffolk coast and within the SEA study area**

Location	Attraction
Hunstanton	Hunstanton is the only coastal resort in the East of England where the sun can be seen to set over the sea. It is a popular summer seaside destination and is close to Sandringham and the RSPB reserves at Titchwell and Snettisham.
King's Lynn	King's Lynn is full of maritime heritage and is a centre for local business and commerce. There are two music festivals each summer as well as literature and poetry festivals to attract tourists.

In addition to this, the Wash contains several caravan sites, which support tourism in the plan area for coastal recreation and bird watching.

The ongoing viability of tourism in this area is also dependent on a range of smaller facilities and settlements which cater to the needs of tourists and actively enable visitors to interact with the local area and its attractions. The area is extensively visited for its natural and remote feel, providing ideal environment for birdwatchers, hikers and nature lovers. Examples include the RSPB reserve at Snettisham which includes a car park and numerous bird hides and the Peter Scott Walk – a footpath which enables access along the coast and to other tracks which link the foreshore with the coastal hinterland. These facilities coupled with the range of small convenience shops (such as at Freiston) collectively provide the features on which tourism depends.

### L3.6 Critical infrastructure

Critical infrastructure within the Wash SMP SEA study area is presented in **Table 3.8** and **Figure 3.9**. The study area is bounded by a number of A-roads that loosely follow the coastline and provide critical transportation links between settlements in the area and larger urban centres further inland.

Settlements off the A-roads are served by a network of B-class roads, with much of the remaining road network being single-tracked and unclassified.

**Table 3.8 Critical infrastructure within The Wash SMP SEA study area**

<b>Critical Infrastructure</b>	<b>Description</b>
A149	Within the study area, the A149 runs from Hunstanton to King's Lynn, passing via the coastal communities of Snettisham and Dersingham.
A17	The A17 runs from King's Lynn and loosely follows the coast of the south-west part of the Wash, continuing on to Sleaford and linking settlements including Holbeach, Long Sutton and Sutton Bridge.
A16	The A16 runs from Stamford to Boston before continuing inland towards north Lincolnshire.
A52	The A52 links Boston to Skegness and follows the coast of the Wash relatively closely, linking small settlements including Wainfleet.
A47	A major arterial route for East Anglia that links Great Yarmouth, Norwich, Swaffham, King's Lynn, Wisbech and Peterborough.
Rail link from King's Lynn to Cambridge	King's Lynn is the final stop on the Fen Line that stops at a number of settlements including Watlington, Downham Market, Littleport, Waterbeach and Ely.
Port of Boston	The Port of Boston is the largest port within The Wash and is capable of handling vessels up to 120m LOA and a maximum beam of 13.6m. The port offers 650m of quay frontage, 18,000m <sup>2</sup> of covered warehouse storage, 8,000 tonnes of grain silos and a secure container park. The Port of Boston handles in the region of 450 to 500 vessels per annum. Annual tonnage through the port is approximately 850,000 – 900,000 tonnes.
Port of King's Lynn	King's Lynn primarily handles agribulks, forest products, steel and break-bulk cargoes, utilising a range of specialised berths and facilities. The port has benefited from investment by ABP in recent years, seeing the creation of a high-capacity, dock-side silo complex that facilitates efficient processing of grain.
Boston to Skegness railway	Limited railway line between Boston and Skegness
Sutton Bridge Port	Sutton Bridge Port is a modern 62 acre dry cargo port and warehouse complex on the UK East coast, and has the capability to handle almost any dry cargo, with a particular focus on steel, timber bulk commodity and agricultural products.
Sutton Bridge power station	790MW Gas fired power station that supplies two per cent of the electricity for England and Wales.
Gedney Marsh Wind Farm	12MW installation consisting of 6 x 2MW Repower MM82 turbines.

There are also two Royal Air Force (RAF) weapons ranges located on The Wash, at Wainfleet and Holbeach, both of which are of national military significance (WESG, 2004).

Figure 3.9 Infrastructure



### L3.7 Water quality and supply

The river catchments within The Wash Catchment Abstraction Management Strategy (CAMS) comprise of the Rivers Witham, Welland, Nene and Great Ouse. The catchments around The Wash are a critical element in determining the physical form and evolution of the coast.

The drainage basin of The Wash includes the major aquifers of the East Anglian Chalk and Lincolnshire Limestone as well as locally important aquifers in Bedfordshire (Lower Cretaceous Greensand) and North West Norfolk (chalk and crag overlain by varying thicknesses of Quaternary sands and gravels). These have all been extensively developed for public water supplies.

Licensed abstraction locations within the study area are limited. **Figure 3.10** indicates the main concentration of abstraction areas is around Gedney Marsh north-east of Holbeach, an area of high economic activity due to the agricultural value of the land, and along the Haven, south-east of Boston, one of the larger settlements in the study area. Other abstraction areas are located around Wainfleet, Wrangle, Terrington St Clement and Dersingham, again located in the vicinity of settlements or economic activity. The majority of abstraction areas around The Wash are, however, outside of the SEA study area.

There are no groundwater protection zones within the SMP area, the closest being in north-west Norfolk, close to the village of Sedgeford and approximately 4 miles east of Hunstanton.

A WFD compliance exercise has been run as a parallel process with the SMP and this is provided as **Appendix K**.

Figure 3.10 Licensed Abstraction Locations in Wash SMP SEA Study Area



## L4 ENVIRONMENTAL ISSUES AND ASSESSMENT CRITERIA

### L4.1 Environmental issues

As defined previously in **Section 3**, from a consideration of the policy, legislation and designations relevant to The Wash 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 has been developed to avoid a reliance on generic coastal management issues (although some issues are the same around the coast and are therefore included) and has provided an account of what other plans, management obligations and stakeholders consider to be the most critical environmental issues on The Wash coast.

The suite of issues provided is as follows:

- 1) Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land;
- 2) Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise;
- 3) The loss of designated intertidal habitat located seaward of existing defences due to sea level rise;
- 4) Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types;
- 5) Maintenance of environmental conditions to support biodiversity and the quality of life; and
- 6) Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash.

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.

**L5 ASSESSMENT**

**L5.1 Assessment methodology**

The assessment is provided at two levels:

- 1) Primary analysis of each Policy Development Zone (PDZ) (detailed assessment); and
- 2) Secondary analysis which seeks to establish the overall effects of all PDZs (the plan as a whole).

The primary analysis has been recorded on a series of detailed tables, which fully document the effect of each PDZ 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 in regard to how specific PDZs have succeeded in compliance with the assessment criteria.

PDZs which have recorded any negative assessments (in regard to the assessment criteria) will be discussed on an individual basis.

The assessment has been provided in response to the policy offered for each PDZ. The Wash SMP is unusual in having ‘uncertain policies’ certain areas (PDZs 1 and 2) where, due to a lack of understanding regarding the effects of sea level rise in later epochs, management options are offered, as opposed to clear policy. Accordingly the assessment summary tables have been provided as follows:

PDZ	Epoch		
	1	2	3
One	HTL	MR or HTL	MR or HTL
Two	HTL	MR/HTL or NAI	MR/HTL or NAI
Three	HTL	HTL	HTL
Four	NAI	NAI	NAI/HTL

depending on monitoring and erosion rates

based on a collaborative approach

Policy Options as provided below in Tables 5.2 and 5.3

Policy as provided below in Table 5.1

The assessment is recorded as a colour coded record as outlined in **Table 2.1** which is as follows:

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

#### L5.1.1 The consideration of alternatives.

As described previously, due to the nature of SMP policy, a consideration of each of the four available SMP policy options, for each policy area is not appropriate. The effects of policy in one area are typically determined by others in the same PDZ. Equally, the SMP process provides for policy development and evaluation in response to the drivers for coastal policy (the need to defend coastal communities etc). A more appropriate response to the consideration of alternative options is the use of baseline scenarios which form the basis of SMP development.

In this respect, alternatives will be considered in the narrative below only insofar as they relate to genuine alternative management options for the PDZs. In response to drivers for policy, the SMP has established that there are no drivers for MR on any PDZ during Epoch 1. The effects of sea level rise are not evident within Epoch 1 to provide any driver to realign the coast in this period and accordingly, it would not seem appropriate to consider the effects of a policy for which there is no tenable basis to pursue.

The assessment for PDZs 1 and 2 has been provided on the basis of an assessment of HTL for Epoch 1. For PDZ 1 an assessment for both management options (HTL and MR) for Epoch 2 and 3. No assessment has been provided for PDZ 2 for Epoch 2 and 3 because of the lack of any certain policy, this will be provided by a separate collaborative process to establish a sustainable approach to the management of this frontage. Within the SMP the actual option pursued will be provided in response to an understanding of the manner in which sea level rise is affecting The Wash in Epoch 2 and 3. An alternative option of MR has also been provided for Epoch 1 on these frontages.

Equally, for PDZs 3 and 4 there are no drivers which have been established for any policy option other than the selected option. PDZ 3 provides a HTL approach adjacent to Hunstanton and ensures that the town will remain defended for all three epochs. Any other policy option either has no driver (e.g. Advance the Line) or would lead to the loss of the key features in the PDZ (e.g. to pursue MR in the town). PDZ 4 offers an NAI approach for all three epochs for a soft cliff area and again, no drivers have been identified for any other policy option. For PDZs 3 and 4 therefore, an assessment has been provided for the preferred policy option only, since there is considered to be no realistic alternative options.

An assessment in line with the above, based on realistic driver based management options is therefore considered the appropriate approach to this assessment and is reflected in the tables in **Annex I** and the summary tables provided below. In this respect the SEA will mirror and have direct regard to the real alternatives within the context of the SMP. **Annex I** therefore provides the detail, which supports the assessment and conclusions described below.

**Tables 5.1 – 5.4** provide a summary of the assessment tables provided in **Annex I**.

**Table 5.1 Combined Assessment - \* Preferred Policy (Epoch 1 for PDZ 1 and 2 and Epoch 1, 2 and 3 for PDZ 3 and 4).**

SMP Assessment Criteria	SEA Assessment Criteria	Epoch 1 (options for Epoch 2 & 3 in Table 5.2 & 5.3)		Epoch 1, 2 & 3	
		PDZ 1	PDZ 2	PDZ 3	PDZ 4
Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land					
Protect as much grade 1 and grade 2 land as possible.	Will SMP policy result in a change in extent of grade 1 and 2 agricultural land?				
Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise					
Avoid interruption of the drainage function of Rivers Witham, Welland, Nene and Great Ouse throughout the plan period	Will the SMP policy result in a change to the drainage function of discharging rivers?				
Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements and the area landward from these settlements	Will the SMP policy result in a change in flood and erosion risk to coastal communities?				
To maintain Hunstanton as a viable town, seaside resort and regional commercial centre throughout the plan period	Will the SMP policy result in a change in flood and erosion risk to coastal communities?				
To protect as much of the existing development from cliff erosion as possible	Will the SMP policy result in a change in flood and erosion risk to coastal communities?				

SMP Assessment Criteria	SEA Assessment Criteria	Epoch 1 (options for Epoch 2 & 3 in Table 5.2 & 5.3)		Epoch 1, 2 & 3	
		PDZ 1	PDZ 2	PDZ 3	PDZ 4
Provide sufficient time, if required, for community adaptation	Will the SMP policy result in a change in flood and erosion risk to coastal communities?				
Avoid interruption of the functioning of Boston Port and King's Lynn Port throughout the plan period (note that Sutton Bridge Port is only dealt with in the relevant Timing of Policies Objective, and does not have an individual Objective)	Will the SMP policy affect the access to operation of ports?				
Provide sufficient time, if required, for adaptation of Sutton Bridge Port	Will the SMP policy affect the access to operation of ports?				
Avoid interruption of transport connections and utility supply throughout the plan period – ROADS (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?				
Avoid interruption of transport connections and utility supply throughout the plan period – PRISON (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?				
To balance the costs of long-term sea wall maintenance with the long-term impacts on tourism values and the long-term costs of loss or relocation of the caravan parks (Heacham)	Will the SMP policy result in a change to key tourism and recreation features?				

SMP Assessment Criteria	SEA Assessment Criteria	Epoch 1 (options for Epoch 2 & 3 in Table 5.2 & 5.3)		Epoch 1, 2 & 3	
		PDZ 1	PDZ 2	PDZ 3	PDZ 4
To balance the costs of ongoing shingle ridge maintenance with the costs of loss or relocation of the beach huts at Snettisham.	Will the SMP policy result in a change to key tourism and recreation features?				
To maintain the existing level of intertidal beach area throughout the plan period	Will the SMP policy result in a change to key tourism and recreation features?				
Provide for recreational access to the foreshore	Will the SMP policy result in a change to key tourism and recreation features?				
To maintain the integrity of the coastal landscape	Will the SMP policy result in a change in the quality of the coastal landscape?				
The loss of designated intertidal habitat located seaward of existing defences due to sea level rise					
Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and saline/coastal lagoons (where present)	Will SMP policy result in a change to conditions of European sites or habitats? Will SMP policy result in a change to SSSI condition? Will SMP policy result in a net change in priority BAP habitat extent?				
Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types					
Have as little flood and erosion risk management throughout the plan period as possible	Will the SMP policy result in a change in the operation of coastal processes?				

SMP Assessment Criteria	SEA Assessment Criteria	Epoch 1 (options for Epoch 2 & 3 in Table 5.2 & 5.3)		Epoch 1, 2 & 3	
		PDZ 1	PDZ 2	PDZ 3	PDZ 4
To maintain natural processes relating to cliffs	Will the SMP policy result in a change in the operation of coastal processes?				
To prevent interruption of the role of cliff erosion in supplying sediment to the neighbouring Frontages (including Hunstanton beach)	Will the SMP policy result in a change in the operation of coastal processes?				
Maintain natural processes relating to sand and shingle shorelines mudflats, saltmarsh, sand dunes and saline/coastal lagoons (where present)	Will the SMP policy result in a change in the operation of coastal processes?				
Allow for natural interaction between beaches and dune systems	Will the SMP policy result in a change in the operation of coastal processes?				
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>					
	Will SMP policy result in changes to features covered by local WFD objectives?	Please refer to Appendix K (WFD Assessment)			
<b>Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash</b>					
Provide sufficient time, if required, for research of archaeological features	Will the SMP policy result in a change to designated and non-designated historic features?				

**Table 5.2 Managed Realignment Option for PDZ 1 for Epoch 2 and 3.**

SMP Assessment Criteria	SEA Assessment Criteria	PDZ 1
Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land		
Protect as much grade 1 and grade 2 land as possible.	Will SMP policy result in a change in extent of grade 1 and 2 agricultural land?	
Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise		
Avoid interruption of the drainage function of Rivers Witham, Welland, Nene and Great Ouse throughout the plan period	Will the SMP policy result in a change to the drainage function of discharging rivers?	
Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements and the area landward from these settlements	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	
Protect as many settlements as possible.	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	
Provide sufficient time, if required, for community adaptation	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	
Avoid interruption of the functioning of Boston Port and King's Lynn Port throughout the plan period (note that Sutton Bridge Port is only dealt with in the relevant Timing of Policies Objective, and does not have an individual Objective)	Will the SMP policy affect the access to operation of ports?	
Provide sufficient time, if required, for adaptation of Sutton Bridge Port	Will the SMP policy affect the access to operation of ports?	
Avoid interruption of transport connections and utility supply throughout the plan period – ROADS (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	

SMP Assessment Criteria	SEA Assessment Criteria	PDZ 1
Avoid interruption of transport connections and utility supply throughout the plan period – PRISON (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	
Avoid interruption of transport connections and utility supply throughout the plan period – RAILWAY LINE (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	
Provide sufficient time, if required, for recreational access to the foreshore	Will the SMP policy result in a change to key tourism and recreation features?	
To maintain the integrity of the coastal landscape	Will the SMP policy result in a change in the quality of the coastal landscape?	
<b>The loss of designated intertidal habitat located seaward of existing defences due to sea level rise</b>		
Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and saline/coastal lagoons (where present)	Will SMP policy result in a change to conditions of European sites or habitats? Will SMP policy result in a change to SSSI condition? Will SMP policy result in a net change in priority BAP habitat extent?	
<b>Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types</b>		
Have as little flood and erosion risk management throughout the plan period as possible	Will the SMP policy result in a change in the operation of coastal processes?	
Maintain natural processes relating to sand and shingle shorelines mudflats, saltmarsh, sand dunes and saline/coastal lagoons (where present)	Will the SMP policy result in a change in the operation of coastal processes?	

SMP Assessment Criteria	SEA Assessment Criteria	PDZ 1
Maintenance of environmental conditions to support biodiversity and the quality of life		
	Will SMP policy result in changes to features covered by local WFD objectives?	
Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash		
Provide sufficient time, if required, for research of archaeological features	Will the SMP policy result in a change to designated and non-designated historic features?	

**Table 5.3 Hold the Line Option for PDZ 1 for Epoch 2 and 3.**

SMP Assessment Criteria	SEA Assessment Criteria	PDZ 1
Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land		
Protect as much grade 1 and grade 2 land as possible.	Will SMP policy result in a change in extent of grade 1 and 2 agricultural land?	
Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise		
Avoid interruption of the drainage function of Rivers Witham, Welland, Nene and Great Ouse throughout the plan period	Will the SMP policy result in a change to the drainage function of discharging rivers?	
Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements and the area landward from these settlements	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	
Protect as many settlements as possible.	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	
Provide sufficient time, if required, for community adaptation	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	
Avoid interruption of the functioning of Boston Port and King's Lynn Port throughout the plan period (note that Sutton Bridge Port is only dealt with in the relevant Timing of Policies Objective, and does not have an individual Objective)	Will the SMP policy affect the access to operation of ports?	
Provide sufficient time, if required, for adaptation of Sutton Bridge Port	Will the SMP policy affect the access to operation of ports?	

SMP Assessment Criteria	SEA Assessment Criteria	PDZ 1
Avoid interruption of transport connections and utility supply throughout the plan period – ROADS (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	
Avoid interruption of transport connections and utility supply throughout the plan period – PRISON (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	
Avoid interruption of transport connections and utility supply throughout the plan period – RAILWAY LINE (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	
Provide sufficient time, if required, for recreational access to the foreshore	Will the SMP policy result in a change to key tourism and recreation features?	
To maintain the integrity of the coastal landscape	Will the SMP policy result in a change in the quality of the coastal landscape?	
The loss of designated intertidal habitat located seaward of existing defences due to sea level rise		
Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and saline/coastal lagoons (where present)	Will SMP policy result in a change to conditions of European sites or habitats? Will SMP policy result in a change to SSSI condition? Will SMP policy result in a net change in priority BAP habitat extent?	
Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types		
Have as little flood and erosion risk management throughout the plan period as possible	Will the SMP policy result in a change in the operation of coastal processes?	
Maintain natural processes relating to sand and shingle shorelines mudflats, saltmarsh, sand dunes and saline/coastal lagoons	Will the SMP policy result in a change in the operation of coastal processes?	

SMP Assessment Criteria	SEA Assessment Criteria	PDZ 1
(where present)		
Maintenance of environmental conditions to support biodiversity and the quality of life		
	Will SMP policy result in changes to features covered by local WFD objectives?	
Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash		
Provide sufficient time, if required, for research of archaeological features	Will the SMP policy result in a change to designated and non-designated historic features?	

**Table 5.4 Comparison of Hold the Line and No Active Intervention option for PDZ 4 for Epoch 3.**

SMP Assessment Criteria	SEA Assessment Criteria	Epoch 3	
		HTL	NAI
Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise			
To maintain Hunstanton as a viable town, seaside resort and regional commercial centre throughout the plan period	Will the SMP policy result in a change in flood and erosion risk to coastal communities?		
To protect as much of the existing development from cliff erosion as possible	Will the SMP policy result in a change in flood and erosion risk to coastal communities?		
Provide sufficient time, if required, for community adaptation	Will the SMP policy result in a change in flood and erosion risk to coastal communities?		
Avoid interruption of transport connections and utility supply throughout the plan period – ROADS (where present)	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?		
To maintain the existing level of intertidal beach area throughout the plan period	Will the SMP policy result in a change to key tourism and recreation features?		
To maintain the integrity of the coastal landscape	Will the SMP policy result in a change in the quality of the coastal landscape?		
The loss of designated intertidal habitat located seaward of existing defences due to sea level rise			
Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and saline/coastal lagoons (where present)	Will SMP policy result in a change to conditions of European sites or habitats? Will SMP policy result in a change to SSSI condition?		

SMP Assessment Criteria	SEA Assessment Criteria	Epoch 3	
		HTL	NAI
	Will SMP policy result in a net change in priority BAP habitat extent?		
Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types			
Have as little flood and erosion risk management throughout the plan period as possible	Will the SMP policy result in a change in the operation of coastal processes?		
To maintain natural processes relating to cliffs	Will the SMP policy result in a change in the operation of coastal processes?		
To prevent interruption of the role of cliff erosion in supplying sediment to the neighbouring Frontages (including Hunstanton beach)	Will the SMP policy result in a change in the operation of coastal processes?		
Maintenance of environmental conditions to support biodiversity and the quality of life			
	Will SMP policy result in changes to features covered by local WFD objectives?		
Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash			
Provide sufficient time, if required, for research of archaeological features	Will the SMP policy result in a change to designated and non-designated historic features?		

## L5.2 Primary Analysis: a detailed assessment of PDZs

The overriding theme to have emerged from this assessment is that for Epoch 1, all PDZs have a pattern of either a neutral or minor positive effect when assessed against the developed SEA assessment criteria. In Epoch 2 and 3, the issues relating to how the Wash responds to sea level rise and the management options provided in regard to this, do however have the potential to have a negative effect on various environmental receptors. Such effects are, however, born from either the loss of foreshore areas through realignment or in contrast, the effects of coastal squeeze through holding the line. This is welcome confirmation that adherence to the SMP guidance (which is intended to develop policy in response to environmental considerations) has ensured that policy development has been driven by and is responsive to the identified environmental issues on The Wash.

The detailed assessment is provided in **Annex 1**, where each policy or policy option has been assessed for each PDZ. An assessment of the trends and findings that emerge from this detailed assessment is provided below:

### L5.2.1 PDZ 1

As outlined above, an assessment for PDZ 1 has been provided for:

- The preferred policy of HTL for epoch 1;
- An alternative of MR for epoch 1;
- A policy option of HTL for epoch 2 and 3; and
- A policy option of MR for epoch 2 and 3.

#### Epoch 1

##### *Preferred Policy:*

The preferred policy option of HTL was only considered to have one adverse effect during this epoch, namely the effects on coastal processes of holding the line for this epoch. This was not scored major negative, since The Wash has been defended for a long period of time and the form of The Wash, as seen today, has developed in response to the actual provision of defence. The policy is a continuation of existing shoreline management in this PDZ, which holds the line via a system of private and public sea defences. This policy scores minor positive for most of the assessment criteria since it offers ongoing protection for key community assets which lie landward of the held line. Additionally during this epoch, the effects of the HTL policy are not considered to have a negative effect on coastal habitat seaward of the defences, since the analysis of the effects of sea level rise and the defence to not indicate any significant changes in habitat extent, function or composition.

##### *Alternative Policy Option:*

The alternative of pursuing an MR policy along this frontage provides a range of positive benefits (due to the time taken for the shoreline to respond to any MR in this area), but is considered to have numerous minor negative effects where community assets (agricultural land, coastal access and roads etc) would be ultimately diminished. On the basis of the assessment, the preferred policy remains the most beneficial option in regard to the effects of community assets and the maintenance of viable coastal communities. Simply, this option would lead to adverse effects on receptors located landward of the existing defence and the benefits of the actual realignment, would be marginal during this epoch.

### Epochs 2 and 3

The uncertainty relating to how the morphology and ecology of The Wash will respond to climate change and coastal policy has prevented the SMP from offering a single preferred policy in this area. It follows therefore, that the effects of either option offered (MR or HTL) are subject to those same uncertainties. Equally, it must be stressed that the SMP advocates the selection of the preferred policy based on a determination of the observed shifts in The Wash over time. The assessment for both options must, therefore, be considered indicative and subject to future more informed consideration as the effects of the plan and sea level rise are monitored and considered.

Both options provide similar benefits but differ where the actual effects of either MR or HTL manifest themselves on:

- The loss of agricultural land through MR; or
- The loss of intertidal habitat through HTL.

The determination of which is the 'preferential' option has not been made by the SMP at this time, and neither can it in the course of this assessment. On balance however, the wider effects of both options are similar, with the key difference being effects on agricultural land and intertidal habitat, it therefore remains for the actual selection of policy to be made in response to how The Wash changes in coming epochs and whether the loss of agricultural land is considered more or less important than the loss of international habitat (and it's role in supporting international bird species).

#### L5.2.2 PDZ 2

In the same way that PDZ1 was assessed, an assessment for PDZ 2 has been provided for:

- The preferred policy of HTL for epoch 1;
- An alternative of MR for epoch 1;
- A policy option of HTL for epoch 2 and 3; and

- A policy option of MR for epoch 2 and 3.

### Epoch 1

#### *Preferred Policy:*

The effects of the preferred policy option were similar to those of PDZ1. The HTL policy provides ongoing defence for coastal communities, but will have an adverse effect on the intent to allow coastal processes to develop naturally. The preferred policy does however have the potential to have a negative effect through HTL on the habitat adjacent to the designated saline lagoons at Snettisham. It is expected however that management based on existing practice will not have any significant impact on habitat. The specific effects of this policy on the lagoons, coastal properties (caravans and holiday homes) and coastal habitat seaward of the defences are under consideration; however the effect was considered minor negative at this stage. The analysis to support the SMP has indicated that the effects of SLR during this epoch will be limited, and the continuation of existing policy will simply ensure that existing coastal values (and receptors) are maintained, and the effects of actually holding the line will be extremely limited.

#### *Alternative Policy Option:*

The alternative to this policy of MR, would for the same reasons as PDZ1, provide some adverse effects due to the loss in a short time frame of coastal agricultural land, access and features. As stated in the analysis of Epoch 1, realignment in this period would have a variety of negative effects on receptors behind the defences, whilst the realignment itself would not offset any negative effects, since the effects of the defences in this epoch are extremely limited. The pursuit of the MR policy would simply provide a benefit of allowing more natural coastal processes to evolve, but at the cost of not allowing time for communities to adapt to such change. The preferred policy remains to provide the most benefits and least adverse effects in this epoch.

### Epochs 2 and 3

The issues are essentially the same as PDZ1 for this period and the same reservations apply to assessing the effects of policy. Due to the differing nature of the features around the defence in this frontage however, the actual effects are not entirely consistent with those in PDZ1. The consideration of the relative effects of losing agricultural land and coastal habitat remain a central consideration, but the effects in this PDZ are also more significant in regard to a wider range of coastal habitat and diversity of community features. For example, PDZ2 contains features which support a wider range of recreational and tourism based activity, such as the shingle beaches adjacent to Snettisham and Heacham etc. The assessment in **Annex I** indicates that the MR policy would appear to be the most beneficial option;

however this is based on the major negative effects that are considered likely for the HTL option in regard to the effects on:

- The effects on the intertidal (sand, shingle etc) habitat adjacent to Snettisham; and
- The potential effects on the beach and dune systems in this area.

It must be remembered however, that at the present time the effects of the SMP and SLR in this area are uncertain in these epochs. The negative scores above have therefore been provided, based on an assessment today, of what those effects may be. Which of the two options will prove to be the most beneficial, will need to be considered as The Wash responds to management during Epoch 1. At this time, the uncertainties are such that the actual likely effects of either option cannot be fully established.

It is important to remember that policy selection for these epochs will be provided by an agreed collaborative process between coastal stakeholders to provide a sustainable approach to management. This process will inform management, and the assessment at this time, within this SEA can only provide an overview of issues that will be addressed in detail in coming years.

Since at the present time we don't know what policy will be selected, or have an informed position about local issues of sustainability, the defence of communities, effects of coastal habitat, no formal SEA based assessment can be made at this time.

### L5.2.3 PDZ 3

In contrast to PDZs 1 and 2, the consideration of PDZ 3 is relatively straightforward. The issues here relate to the defence of Hunstanton, an established coastal town with a coastal community and role as a key tourism hub. The viability of Hunstanton is dependent on the maintenance and defence of the town, and the provision of a sandy, beach foreshore.

As outlined above, there are no drivers for any other policy option on this frontage, MR or NAI would lead to the loss of the town, community and coastal assets, bringing a singular benefit of allowing the coast to behave naturally (albeit one that has been defended for over a hundred years). The preferred policy, a continuation of the existing policy, is based upon the clear requirement to defend a key coastal town.

The preferred policy option therefore, provides minor positive benefit (since it is a continuation of existing policy, rather than a shift in management) to the intent to retain Hunstanton as a viable coastal/tourism based community and to contribute to the coastal landscape (and the town's role within it as an established coastal town). As stated the minor negative effect is one of not allowing natural coastal processes, however this is an unavoidable negative

wherever a line is held. It is not considered that in holding the line on this location there would be adverse effects elsewhere.

For the three epochs of the plan therefore, this preferred policy appears to be the most beneficial to the environment and the only tenable management option.

#### L5.2.4 PDZ 4

PDZ 4 covers the soft cliffs to the north of Hunstanton's coastal frontage. At the top of the cliffs, residential properties are set back approximately 50m from the edge by a cliff top area of open space.

##### *Preferred Policy:*

The policy of NAI for three epochs is based on the intent to allow the cliffs to erode naturally, continue to provide their defence function (expected to be beyond the lifetime of the plan in Epoch 3) and through erosion - supply sediment to feed the beach at Hunstanton. The only possible alternative option would be to HTL by defending the toe of the cliffs, excavation of the cliffs for MR is not considered a feasible option.

The preferred option is not considered likely to lead to the loss of the coastal properties at the top of the cliff (due to the rate of erosion anticipated and the distance of the properties from the cliff). The policy provides benefits in enabling the natural development of the coast and providing the supply of sand to the beach which is critical to the sustainability of Hunstanton as a tourist destination. This option scores minor negative due to the potential loss of archaeological features as the cliff erodes, however this would be a gradual process, allowing time for investigation and the actual process of erosion is in itself central to the exposure of a fresh face on the cliffs (which provides for the observation of new finds).

##### *Alternative Policy Option:*

A HTL policy has also been appraised for epoch 3, as this policy would be implemented should erosion risk threaten the properties or infrastructure located above Hunstanton Cliffs. On the whole, a HTL policy at the cliff would protect the community above the cliff line, but would starve the coast to the south of sediment, detrimentally impacting one of the town's key tourism assets, its beach. Indeed, the impact of a HTL policy at the toe of the cliffs would be largely detrimental to all receptors considered; the open cliff face would not be maintained and the implementation of the policy would ensure an additional and continued commitment to erosion risk management. As such, this option does not look favourable unless the community above the cliffs is threatened.

### **L5.3 Secondary analysis – a consideration of the likely effects of the SMP on the key environmental issues of The Wash**

Of the issues that were identified in the **Scoping Report** and presented in **Section 4** of this report, two issues remain prominent as factors where the SMP has been identified as being likely to have a negative effect (based on the pursuit of varying management options); the issue of the loss of agricultural land or coastal features through realignment, or the loss of habitat through the pursuit of HTL policies in combination with sea level rise.

The plan offers a wide variety of potential benefits across the range of environmental issues provided in **Section 4**, but the potential for effects in agriculture or habitat remains, with the actual effect being dependent on:

- How The Wash evolves in response to sea level rise;
- The effects of epoch 1 policy; and
- The selection of policy for epoch 2 and 3 for PDZs 1 and 2.

The manner in which these effects manifest themselves will be dependent on the course of action specified in the SMP, where the coast will be monitored and policy provided to respond to this. The choice of option will however, determine the mitigation required to offset the negative effects of the SMP and this matter will need consideration in the Post Adoption Statement.

### **L5.4 Overall Impacts of The Wash SMP**

The SMP provides a wide range of positive environmental benefits to The Wash, through the maintenance of key coastal settlements, defence of agricultural land, management of coastal habitat and protection of the coastal landscape. The benefits or negative effects in Epochs 2 and 3 are more difficult to establish and are dependent on sea level rise, coastal evolution and the actual selection of policy for Epoch 2 and 3.

The long term (overall) effects of the plan cannot be established at this time, however, the mechanism provided by the SMP (of monitor and respond) offers the most advantageous and robust approach to avoiding negative environmental effects. Considering the benefits in Epoch 1 outlined in this assessment, and the approach to offering appropriate policy based on informed monitoring, the plan offers a wide range of positive effects with only limited minor effects (found where a trade off is required for a positive benefit). The issue relating to the trade off between maintaining agricultural land and intertidal habitat will, however, need to be considered in selecting policy for Epochs 2 and 3. However, subsequent SMPs are considered likely to be in a more considered position to make that decision. This SMP paves the way for enabling that decision to be made on the basis of a programme of monitoring and the implementation of appropriate Epoch 1 policy.

Given the uncertainties that remain, the SMP is considered to provide the most appropriate and prudent approach to management for The Wash, and this assessment supports that position.

A further factor for consideration in this assessment and the development of the SMP itself is that the SMP will be signed off as setting the high level strategic direction of the intent to manage the shoreline on the understanding that it cannot be put into effect until further detailed appraisal and assessment has taken place on plans or projects arising out of the plan itself, which demonstrates they have met the requirements of the Habitats Regulations.

## **L6 MITIGATION & 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. SMP policy in some management areas work against natural processes, for example, in order to hold key areas of coast to protect other environmental values. It is the manner in which policy is applied across the whole SMP area, in order to provide balance, that is the important factor in such examples and therefore, mitigation is not appropriate or required.

However, the SMP does require mitigation for singular effects, where an adverse effect has been identified. It is considered that in this context, the following measures are required to support the SMP to avoid an adverse effect on the environmental values of The Wash.

As outlined in this assessment, the SMP will be accompanied by an extensive programme of monitoring to inform the selection of policy for Epochs 2 and 3 in PDZs 1 and 2. The monitoring provisions of the SEA will align with this programme and consider the following factors.

### **L6.1 Habitat monitoring and management**

#### **L6.1.1 Effects on the integrity of international sites**

The Habitats Regulation Assessment will provide the definitive guide in relation to the effects of the SMP. However, due to the options based approach to Epoch 2 and 3, there will be a need to ensure that the manner in which intertidal habitat responds to the Epoch 1 HTL policy and sea level rise is monitored and assessed. The consideration of the extent of intertidal habitat and the ratio of mudflat to saltmarsh will therefore, require ongoing consideration (and linked to the monitoring of BAP habitat – see below).

#### **L6.1.2 Loss of BAP Habitat**

One of the main effects of SMP policy will be the shift in transitional habitat composition (particularly the loss or gain of intertidal habitat and the relative ratios of mudflat to saltmarsh). The actual effect will be dependent on the selection of policy for Epoch 2 and 3. 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 informs the BAP recording process. This mechanism is required to ensure that wider mechanisms exist for BAP habitat creation which addresses emerging requirements based on the effects of the SMP.

### L6.1.3 Impacts on SSSIs

The SMP has the potential to affect the condition of SSSIs through changes in habitat and coastal management (due to the number of SSSIs on the coast), with knock-on effects on the high level targets relating to SSSIs in favourable condition. A key tool, therefore, in managing and monitoring change on The Wash is the continued monitoring of SSSI units, which enables an early determination of where favourable condition may be threatened by inappropriate coastal management (SMP policy). It is considered that the existing monitoring programme undertaken 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.

### L6.1.4 Expenditure on coastal defence

The SMP provides policy direction which is indicative of expenditure required on the coast. Simply, where SMP policy relates to the provision, enhancement or replacement of defences, the SMP policy will be instrumental in securing funding for schemes, since it is a key consideration in the determination of applications for funding.

It is not the intent or role of the SMP to secure funding, as a mechanism for policy. It therefore follows that in providing policy direction, the SMP fulfils its role in identifying the areas where funding will be required. To this end, it is considered outside of the scope of the SMP to provide funding as mitigation for policy.

### L6.1.5 Investigation of coastal cultural and archaeological sites

No examples were found where SMP policy would lead to the loss of sites/features which are important to the historic environment such as Scheduled Monuments, Listed Buildings etc.

There may, however, be other 'unknown' sites which may only come to light as the SMP is implemented or indeed as the coast erodes. 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 SMP 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 either in writing or electronically to:

Mat Cork  
Senior Environmental Scientist  
Royal Haskoning  
Rightwell House  
Bretton  
Peterborough  
PE3 8DW

m.cork@royalhaskoning.com

### **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 the assessment criteria which should be used to assess the plan?
- Is the information provided correct? and
- 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. Feedback received will shape the finalisation of this report and the evaluation of the environmental effects of the SMP. The final consideration and endorsement of the plan will be provided in response to these issues.

### **L7.2 Subsequent Documents**

Following the completion of this report, a Post Adoption Statement will be provided which will 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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**ANNEX I**  
**Environmental Assessment**

**Table 1 PDZ 1 Epoch 1**

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land</b>						
Soil	<b>Agriculture</b>	Protect as much Grade 1 and Grade 2 land as possible	Soil and agricultural land quality	Will SMP policy result in a change in extent of Grade 1 and 2 agricultural land?	Amount of Grade 1 and Grade 2 agricultural land available	Policy (HTL): SMP policy will not lead to loss of any Grade 1 or 2 agricultural land within this PDZ within epoch 1. Therefore minor positive.
Soil	<b>Agriculture</b>	Ensure that the impact on the UK's area of Grade 1 and Grade 2 land is acceptable: ensure that there is at least X area in Epoch 1 / 2 / 3	Soil and agricultural land quality			Alternative (MR): Alternative policy would lead to loss of Grade 1 and 2 agricultural land. Therefore minor negative.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Water	<b>Infrastructure</b>	Avoid interruption of the drainage function of Rivers Witham, Welland, Nene and Great Ouse throughout the plan period	Hydrology and water resources	Will the SMP policy result in a change to the drainage function of discharging rivers?	Number of rivers with impacted drainage function	Policy (HTL): SMP policy will not lead to a change in the drainage function of discharging rivers. Therefore neutral.
						Alternative (MR): SMP policy will not lead to a change in the drainage function of discharging rivers. Therefore neutral.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Population, human health	<b>Communities</b>	Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements and the area landward from these settlements	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of established settlements impacted	Policy (HTL): SMP policy ensures no established settlements are impacted and will not increase flood and erosion risk to coastal communities. Standard of defence will be maintained at or above current standard, therefore minor positive.
						Alternative (MR): A MR policy would ensure that no established settlements would be impacted and would not increase flood and erosion risk to coastal communities, as standard of defence would be maintained at or above current standard, therefore minor positive.
Population, human health	<b>Communities</b>	Protect as many settlements as possible	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number	Policy (HTL): SMP policy ensures no additional properties lie within the tidal flood zone in comparison to the current number. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.
						Alternative (MR): Within epoch 1, a MR policy would ensure that no properties lie within the tidal flood zone in comparison to the current number. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
Material assets	<b>Communities</b>	Protect as many settlements as possible	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number	Policy (HTL): SMP policy would ensure that local infrastructure and assets (roads and access to foreshore) are maintained. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.
						Alternative (MR): MR would lead to the loss of local infrastructure and assets (roads and access to foreshore). Although flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, this is scored as minor negative.
	<b>Timing</b>	Provide sufficient time, if required, for community adaptation	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?		Policy (HTL): SMP policy would ensure that time is allowed for adaptation of coastal communities. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.
						Alternative (MR): MR would ensure that areas of agricultural land (with concomitant economic benefits) would be lost within the first epoch. This is therefore scored, on balance, as a minor negative.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Infrastructure</b>	Avoid interruption of the functioning of Boston Port and King's Lynn Port throughout the plan period (note that Sutton Bridge Port is only dealt with in the relevant Timing of Policies Objective, and does not have an individual Objective)	Critical infrastructure	Will the SMP policy affect the access to operation of ports?	Number of ports impacted	Policy (HTL): SMP policy would not affect the access to operation of ports, therefore maintaining the benefit of the ports to the local, regional and national economy. This is therefore scored as minor positive.
						Alternative (MR): MR would be designed so that there would be no impact on affect the access to operation of ports, therefore maintaining the benefit of the ports to the local, regional and national economy. This is therefore scored as minor positive.
Material assets	<b>Timing</b>	Provide sufficient time, if required, for adaptation of Sutton Bridge Port	Critical infrastructure	Will the SMP policy affect the access to operation of ports?	Number of ports impacted	Policy (HTL): SMP policy would not require adaptation of Sutton Bridge port within epoch 1. This is therefore scored as minor positive.
						Alternative (MR): MR would not impact Sutton Bridge port within epoch 1, as scheme would be designed to ensure no impact. This is therefore scored as minor positive.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>ROADS (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost	Policy (HTL): SMP policy will ensure that there is no change in flood or erosion risk to key roads within this PDZ (A52, A17, A16, A149 & A-roads in settlements) and will ensure that the minor road network linking the coast with these roads are maintained in situ. This is therefore scored as minor positive.
						Alternative (MR): Although a MR policy would maintain the key road network surrounding The Wash in this PDZ (A52, A17, A16, A149 & A-roads in settlements), the minor road network linking the coast with these roads would be impacted. As such, this is scored minor negative.

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
Material assets	Infrastructure	Avoid interruption of transport connections and utility supply throughout the plan period – <b>PRISON (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost	Policy (HTL): SMP policy will ensure that HMP North Sea Camp is maintained in situ, with no increase in flood or erosion risk. This is therefore scored as minor positive.
						Alternative (MR): HMP North Sea Camp is located next to the coast. However, realignment within this PDZ would not be a feasible option for this area. This is therefore scored as minor positive.
Material assets	Infrastructure	Avoid interruption of transport connections and utility supply throughout the plan period – <b>GEDNEY MARSH WIND FARM</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost	Policy (HTL): HTL policy would maintain Gedney Marsh wind farm in situ. Therefore minor positive.
						Alternative (MR): Any MR scheme would be designed to maintain Gedney Marsh wind farm in situ. Therefore minor positive.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	Timing	Provide sufficient time, if required, for recreational access to the foreshore	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected	Policy (HTL): SMP policy will maintain the network of roads and rights of way currently in situ. Recreational features would also be maintained. This is therefore scored as minor positive.
						Alternative (MR): Although SMP policy will maintain major roads and rights of way, minor roads may be lost. However, any roads which may be lost would be those linear to the coast and access to the coast would be maintained. Recreation features may be increased due to the MR policy, therefore minor positive.
Landscape	Landscape	To maintain the integrity of the coastal landscape	Landscape	Will the SMP policy result in a change in the quality of the coastal landscape?	Quantitative judgement	Policy (HTL): SMP policy will not lead to the loss of features considered significant to the landscape. This is therefore scored as neutral.
						Alternative (MR): A MR policy will not lead to the loss of features considered significant to the landscape. This is therefore scored as neutral.
<b>The loss of designated intertidal habitat located seaward of existing defences due to sea level rise</b>						
Biodiversity, flora and fauna	Habitats	Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and saline/coastal lagoons ( <b>where present</b> )	Habitats and species	Will SMP policy result in a change to conditions of European sites or habitats?	Number of European sites and habitats impacted based on Habitats Regulations assessment.	Please refer to <b>Appendix M</b> (Appropriate Assessment)
				Will SMP policy result in a change to SSSI condition?	Number of SSSIs impacted.	
				Will SMP policy result in a net change in priority BAP habitat extent?	Amount of priority BAP habitat impacted	

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types</b>						
Biodiversity, flora and fauna	<b>Flood and Erosion Risk Management</b>	Have as little flood and erosion risk management throughout the plan period as possible	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	<p>Policy (HTL): SMP policy will result in continued flood and erosion risk management throughout epoch 1, although there will be no change in the operation of coastal processes as policy is currently HTL. However, this does not allow natural coastal processes to prevail. This is therefore scored as minor negative.</p> <p>Alternative (MR): MR would result in a shift to a more natural coastal form, although a degree of flood and erosion risk management would still be required. On balance, this is scored as a neutral.</p>
Biodiversity, flora and fauna	<b>Habitats</b>	Maintain natural processes relating to mudflats, saltmarsh, sand dunes and saline/coastal lagoons (where present)	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	<p>Please refer to <b>Appendix M</b> (Appropriate Assessment)</p> <p>Please refer to <b>Appendix M</b> (Appropriate Assessment)</p>
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>						
Water			Water	Will SMP policy result in changes to features covered by local WFD objectives?	Number of features covered by local WFD objectives impacted	<p>Please refer to <b>Appendix K</b> (WFD Assessment)</p> <p>Please refer to <b>Appendix K</b> (WFD Assessment)</p>
<b>Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash</b>						
Cultural heritage, including architectural and archaeological heritage	<b>Timing</b>	Provide sufficient time, if required, for research of archaeological features	Historic environment	Will the SMP policy result in a change to designated and non-designated historic features?	Number of designated and non-designated historic features impacted	<p>Policy (HTL): Two Scheduled Monuments, Wybert's Castle (Medieval moated site) and Multon Hall (Moated site) are located within the study area in this PDZ, while 7 Scheduled Monuments are located in King's Lynn. In addition, a registered park and garden (The Walks) is located in King's Lynn. However, all are located away from the coast and unlikely to be impacted by SMP policy. This is therefore scored as minor positive.</p> <p>Alternative (MR): Two Scheduled Monuments, Wybert's Castle (Medieval moated site) and Multon Hall (Moated site) are located within the study area in this PDZ, while 7 Scheduled Monuments are located in King's Lynn. In addition, a registered park and garden (The Walks) is located in King's Lynn. However, all are located away from the coast and unlikely to be impacted by a MR policy. This is therefore scored as minor positive.</p>

**Table 2 PDZ 1 Epochs 2 & 3**

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land</b>						
Soil	<b>Agriculture</b>	Protect as much Grade 1 and Grade 2 land as possible	Soil and agricultural land quality	Will SMP policy result in a change in extent of Grade 1 and 2 agricultural land?	Amount of Grade 1 and Grade 2 agricultural land available	Policy (HTL): HTL will not lead to loss of any Grade 1 or 2 agricultural land within this PDZ within epochs 2 and 3. Therefore minor positive.
Soil	<b>Agriculture</b>	Ensure that the impact on the UK's area of Grade 1 and Grade 2 land is acceptable: ensure that there is at least X area in Epoch 1 / 2 / 3	Soil and agricultural land quality			Policy (MR): MR would lead to loss of Grade 1 and 2 agricultural land. Therefore minor negative.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Water	<b>Infrastructure</b>	Avoid interruption of the drainage function of Rivers Witham, Welland, Nene and Great Ouse throughout the plan period	Hydrology and water resources	Will the SMP policy result in a change to the drainage function of discharging rivers?	Number of rivers with impacted drainage function	Policy (HTL): HTL will not lead to a change in the drainage function of discharging rivers. Therefore neutral.
						Policy (MR): MR will not lead to a change in the drainage function of discharging rivers. Therefore neutral.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Population, human health	<b>Communities</b>	Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements and the area landward from these settlements	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of established settlements impacted	Policy (HTL): HTL will ensure no established settlements are impacted and will not increase flood and erosion risk to coastal communities. Standard of defence will be maintained at or above current standard, therefore minor positive.
						Policy (MR): Design of MR would ensure that no established settlements would be impacted and would not increase flood and erosion risk to coastal communities, as standard of defence would be maintained at or above current standard, therefore minor positive.
Population, human health	<b>Communities</b>	Protect as many settlements as possible	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number	Policy (HTL): Although an increased number of properties will lie within the tidal flood zone in comparison to epoch 1, HTL policy will ensure that flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
						Policy (MR): Although an increased number of properties will lie within the tidal flood zone in comparison to epoch 1, MR policy would ensure that flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.
Material assets	<b>Communities</b>	Protect as many settlements as possible	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number	<p>Policy (HTL): HTL would ensure that local infrastructure and assets (roads and access to foreshore) is maintained. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.</p> <p>Policy (MR): MR in epochs 2 and 3 would lead to the loss of local infrastructure and assets (roads and access to foreshore). Although flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, this is scored as minor negative.</p>
	<b>Timing</b>	Provide sufficient time, if required, for community adaptation	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?		<p>Policy (HTL): HTL would ensure that time is allowed for adaptation of coastal communities. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.</p> <p>Policy (MR): MR within epochs 2 and 3 would ensure that time is allowed for adaptation of coastal communities. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.</p>
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Infrastructure</b>	Avoid interruption of the functioning of Boston Port and King's Lynn Port throughout the plan period (note that Sutton Bridge Port is only dealt with in the relevant Timing of Policies Objective, and does not have an individual Objective)	Critical infrastructure	Will the SMP policy affect the access to operation of ports?	Number of ports impacted	<p>Policy (HTL): HTL would not affect the access to operation of ports, therefore maintaining the benefit of the ports to the local, regional and national economy. This is therefore scored as minor positive.</p> <p>Policy (MR): MR would be designed so that there would be no impact to affect the access to operation of ports, therefore maintaining the benefit of the ports to the local, regional and national economy. This is therefore scored as minor positive.</p>
Material assets	<b>Timing</b>	Provide sufficient time, if required, for adaptation of Sutton Bridge Port	Critical infrastructure	Will the SMP policy affect the access to operation of ports?	Number of ports impacted	<p>Policy (HTL): HTL policy would not require adaptation of Sutton Bridge port within epoch 2 and 3. This is therefore scored as minor positive.</p> <p>Policy (MR): MR would not impact Sutton Bridge port within epoch 2 and 3, as scheme would be designed to ensure no impact. This is therefore scored as minor positive.</p>
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities	Critical infrastructure lost	Policy (HTL): HTL policy will ensure that there is no change in flood or erosion risk to key roads within this PDZ (A52, A17, A16, A149 & A-roads in settlements) and will ensure that the minor road network linking the coast with these roads are maintained in situ. This is therefore scored as minor positive.

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
		throughout the plan period – <b>ROADS (where present)</b>		and public infrastructure?		Policy (MR): Although a MR policy would maintain the key road network surrounding The Wash in this PDZ (A52, A17, A16, A149 & A-roads in settlements), the minor road network linking the coast with these roads would be impacted. As such, this is scored minor negative.
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>PRISON (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost	Policy (HTL): HTL policy will ensure that HMP North Sea Camp is maintained in situ, with no increase in flood or erosion risk. This is therefore scored as minor positive. Policy (MR): HMP North Sea Camp is located next to the coast. However, realignment within this PDZ would not be a feasible option for this area. This is therefore scored as minor positive.
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>GEDNEY MARSH WINDFARM</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost	Policy (HTL): HTL policy would maintain Gedney Marsh in situ. Therefore minor positive. Policy (MR): Any MR scheme would be designed to maintain Gedney Marsh in situ. Therefore minor positive.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Timing</b>	Provide sufficient time, if required, for recreational access to the foreshore	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected	Policy (HTL): SMP policy will maintain the network of roads and rights of way in situ. Recreational features would also be maintained. This is therefore scored as minor positive. Policy (MR): MR policy will maintain major roads and rights of way, although minor roads may be lost. However, any roads which may be lost would be those linear to the coast and access to the coast would be maintained. Recreation features may be increased due to the MR policy, therefore major positive.
Landscape	<b>Landscape</b>	To maintain the integrity of the coastal landscape	Landscape	Will the SMP policy result in a change in the quality of the coastal landscape?	Quantitative judgement	Policy (HTL): HTL will not lead to the loss of features considered significant to the landscape. This is therefore scored as neutral. Policy (MR): MR policy will not lead to the loss of features considered significant to the landscape. This is therefore scored as neutral.
<b>The loss of designated intertidal habitat located seaward of existing defences due to sea level rise</b>						
Biodiversity, flora and fauna	<b>Habitats</b>	Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and saline/coastal lagoons ( <b>where present</b> )	Habitats and species	Will SMP policy result in a change to conditions of European sites or habitats? Will SMP policy result in a change to SSSI condition? Will SMP policy result in a net change in priority BAP habitat extent?	Number of European sites and habitats impacted based on Habitats Regulations assessment. Number of SSSIs impacted Amount of priority BAP habitat impacted.	Please refer to <b>Appendix M</b> (Appropriate Assessment) Please refer to <b>Appendix M</b> (Appropriate Assessment)

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types</b>						
Biodiversity, flora and fauna	<b>Flood and Erosion Risk Management</b>	Have as little flood and erosion risk management throughout the plan period as possible	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	<p>Policy (HTL): SMP policy will result in continued flood and erosion risk management throughout epochs 2 &amp; 3, although there will be no change in the operation of coastal processes as policy is currently HTL. However, this does not allow natural coastal processes to prevail. This is therefore scored as minor negative.</p> <p>Policy (MR): MR would result in a shift to a more natural coastal form, although a degree of flood and erosion risk management would still be required. On balance, this is scored as a neutral.</p>
Biodiversity, flora and fauna	<b>Habitats</b>	Maintain natural processes relating to mudflats, saltmarsh, sand dunes and saline/coastal lagoons ( <b>where present</b> )	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	<p>Please refer to <b>Appendix M</b> (Appropriate Assessment)</p> <p>Please refer to <b>Appendix M</b> (Appropriate Assessment)</p>
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>						
Water			Water	Will SMP policy result in changes to features covered by local WFD objectives?	Number of features covered by local WFD objectives impacted	<p>Please refer to <b>Appendix K</b> (WFD Assessment)</p> <p>Please refer to <b>Appendix K</b> (WFD Assessment)</p>
<b>Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash</b>						
Cultural heritage, including architectural and archaeological heritage	<b>Timing</b>	Provide sufficient time, if required, for research of archaeological features	Historic environment	Will the SMP policy result in a change to designated and non-designated historic features?	Number of designated and non-designated historic features impacted	<p>Policy (HTL): Two Scheduled Monuments, Wybert's Castle (Medieval moated site) and Multon Hall (Moated site) are located within the study area in this PDZ, while 7 Scheduled Monuments are located in King's Lynn. In addition, a registered park and garden (The Walks) is located in King's Lynn. However, all are located away from the coast and unlikely to be impacted by a HTL policy. This is therefore scored as minor positive.</p> <p>Policy (MR): Two Scheduled Monuments, Wybert's Castle (Medieval moated site) and Multon Hall (Moated site) are located within the study area in this PDZ, while 7 Scheduled Monuments are located in King's Lynn. In addition, a registered park and garden (The Walks) is located in King's Lynn. However, all are located away from the coast and unlikely to be impacted by a MR policy. This is therefore scored as minor positive.</p>

**Table 3 PDZ 2 Epoch 1**

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ2 (Wolferton Creek to South Hunstanton)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land</b>						
Soil	<b>Agriculture</b>	Protect as much Grade 1 and Grade 2 land as possible.	Soil and agricultural land quality	Will SMP policy result in a change in extent of Grade 1 and 2 agricultural land?	Amount of Grade 1 and Grade 2 agricultural land available	Policy (HTL): SMP policy will not lead to loss of any Grade 1 or 2 agricultural land within this PDZ within epoch 1. Therefore minor positive.
Soil	<b>Agriculture</b>	Ensure that the impact on the UK's area of Grade 1 and Grade 2 land is acceptable: ensure that there is at least X area in Epoch 1 / 2 / 3				Alternative (MR): Alternative policy would lead to loss of Grade 1 and 2 agricultural land. Therefore minor negative.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Population, human health	<b>Communities</b>	Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements and the area landward from these settlements	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of established settlements impacted	Policy (HTL): SMP policy ensures no established settlements are impacted and will not increase flood and erosion risk to coastal communities. Standard of defence will be maintained at or above current standard, therefore minor positive. Alternative (MR): A MR policy would ensure that no established settlements would be impacted and would not increase flood and erosion risk to coastal communities, as standard of defence would be maintained at or above current standard, therefore minor positive.
Population, human health	<b>Communities</b>	Protect as many settlements as possible	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number	Policy (HTL): SMP policy ensures no additional properties lie within the tidal flood zone in comparison to the current number. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, while coastal communities such as Snettisham and Heacham will be maintained in situ. Therefore minor positive. Alternative (MR): Within epoch 1, a MR policy would ensure that no properties lie within the tidal flood zone in comparison to the current number. Flood and erosion risk to Heacham, Snettisham and other coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive.
	<b>Timing</b>	Provide sufficient time, if required, for community adaptation	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?		Policy (HTL): SMP policy would ensure that time is allowed for adaptation of coastal communities. Flood and erosion risk to coastal communities will not increase as standard of defence will be maintained at or above current standard, therefore minor positive. Alternative (MR): Design of MR would ensure that flood or erosion risk to coastal communities is not increased, with standard of defence being maintained at or above current standard, therefore minor positive.

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ2 (Wolferton Creek to South Hunstanton)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>ROADS (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost	<p>Policy (HTL): SMP policy will ensure that there is no change in flood or erosion risk to key roads within this PDZ (A149 &amp; local roads in Snettisham and Heacham) and there are no linear roads within this PDZ. This is therefore scored as minor positive.</p> <p>Alternative (MR): Although a MR policy would maintain the key road network surrounding The Wash in this PDZ (A149 &amp; local roads in Snettisham and Heacham) and there are no linear roads within this PDZ. As such, this is scored minor positive.</p>
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Communities</b>	To balance the costs of long-term sea wall maintenance with the long-term impacts on tourism values and the long-term costs of loss or relocation of the caravan parks (Heacham & Snettisham)	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected	<p>Policy (HTL): There are several camping and caravan sites and caravan parks within this PDZ; SMP policy will ensure the continued survival of these sites throughout epoch 1. Therefore minor positive.</p> <p>Alternative (MR): There are several camping and caravan sites and caravan parks within this PDZ; however, any MR scheme will take these into account as there are no drivers for MR in these areas. Therefore minor positive.</p>
Material assets	<b>Communities</b>	To balance the costs of ongoing shingle ridge maintenance with the costs of loss or relocation of the beach huts	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected	<p>Policy (HTL): Key tourism assets in this area are beaches and the access to those beaches. HTL is unlikely to lead to the loss of these features in the first epoch. SMP policy also maintains holiday homes and the benefits to the local economy associated with them. Therefore minor positive.</p> <p>Alternative (MR): Key tourism assets in this area are beaches and the access to those beaches. Any MR, by design, is unlikely to lead to the loss of these features in the first epoch. In addition, holiday homes and the benefits to the local economy associated with them are also likely to be protected at scheme level. Therefore minor positive.</p>
Material assets	<b>Timing</b>	Provide sufficient time, if required, for recreational access to the foreshore	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected	<p>Policy (HTL): SMP policy will maintain the network of roads and rights of way currently in situ. Recreational features would also be maintained. This is therefore scored as minor positive.</p> <p>Alternative (MR): MR in this PDZ would not lead to the loss of roads or the recreational value of the foreshore. This is therefore scored as minor positive.</p>
Landscape	<b>Landscape</b>	To maintain the integrity of the coastal landscape	Landscape	Will the SMP policy result in a change in the quality of the coastal landscape?	Quantitative judgement	<p>Policy (HTL): SMP policy will ensure that the lagoons and dunal systems are maintained throughout the epoch, both of which are key landscape features in this PDZ. This is therefore scored as minor positive.</p> <p>Alternative (MR): A MR policy may lead to the loss of Snettisham lagoons and would also impact the integrity of the current coastal landscape. As such, this is scored as minor negative.</p>

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ2 (Wolferton Creek to South Hunstanton)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>The loss of designated intertidal habitat located seaward of existing defences due to sea level rise</b>						
Biodiversity, flora and fauna	<b>Habitats</b>	Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and coastal lagoons	Habitats and species	Will SMP policy result in a change to conditions of European sites or habitats? Will SMP policy result in a change to SSSI condition? Will SMP policy result in a net change in priority BAP habitat extent?	Number of European sites and habitats impacted based on Habitats Regulations assessment. Number of SSSIs impacted. Amount of priority BAP habitat impacted	Please refer to <b>Appendix M</b> (Appropriate Assessment)
						Please refer to <b>Appendix M</b> (Appropriate Assessment)
<b>Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types</b>						
Biodiversity, flora and fauna	<b>Flood and Erosion Risk Management</b>	Have as little flood and erosion risk management throughout the plan period as possible	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	Policy (HTL): SMP policy will result in continued flood and erosion risk management throughout epoch 1, although there will be no change in the operation of coastal processes as policy is currently HTL. However, this does not allow natural coastal processes to prevail. This is therefore scored as minor negative.
						Alternative (MR): MR would result in a shift to a more natural coastal form, although a degree of flood and erosion risk management would still be required. On balance, this is scored as a neutral.
Biodiversity, flora and fauna	<b>Habitats</b>	Maintain natural processes relating to sand and shingle shorelines, mudflats, saltmarsh, sand dunes and coastal lagoons	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	Policy (HTL): SMP policy will maintain coastal process, albeit on a frontage which is currently HTL. Issues of squeeze will be minimal during epoch 1. Lagoons at Snettisham are man-made and therefore do not require natural process to be maintained. Due to the limiting of natural coastal processes, this is scored as minor negative.
						Alternative (MR): MR would promote natural processes and reduce the (minimal) impacts of squeeze in epoch 1. The lagoons at Snettisham may be lost, although the areas realigned would adopt a more natural coastal form. Minor positive.
Biodiversity, flora and fauna	<b>Habitats</b>	Allow for natural interaction between beaches and dune systems	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	Policy (HTL): SMP policy will allow for a continued interaction between the existing beach and dunes systems, although this will reduce over the course of the epoch. Presence of defences helps to maintain beach frontages, but may have an adverse effect on dunal communities. On balance, this is assessed as neutral.
						Alternative (MR): MR is unlikely to take place behind dunal systems, which would serve to maintain in situ, although MR would promote the evolution of a more natural coastal form in other areas. This is therefore assessed as minor positive.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>						
Water			Water	Will SMP policy result in changes to features covered by local WFD objectives?	Number of features covered by local WFD objectives impacted	Please refer to <b>Appendix K</b> (WFD Assessment)
						Please refer to <b>Appendix K</b> (WFD Assessment)

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ2 (Wolferton Creek to South Hunstanton)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash</b>						
Cultural heritage, including architectural and archaeological heritage	<b>Timing</b>	Provide sufficient time, if required, for research of archaeological features	Historic environment	Will the SMP policy result in a change to designated and non- designated historic features?	Number of designated and non-designated historic features impacted	<p>Policy (HTL): No historic features would be impacted by the preferred policy. Therefore minor positive.</p> <p>Alternative (MR): There is a lack of historic environment features within this PDZ and therefore none would be impacted by any MR policies. This is therefore assessed as minor positive.</p>

**Table 4 PDZ 3 Epochs 1, 2 & 3**

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ3 (Hunstanton Town)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Communities</b>	To maintain Hunstanton as a viable town, seaside resort and regional commercial centre throughout the plan period	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number	Policy (HTL): SMP policy throughout all epochs is HTL; as such, Hunstanton is maintained as a viable town, seaside resort and regional commercial centre throughout the plan period. Therefore minor positive.
Material assets	<b>Intertidal Beach</b>	To maintain the existing level of intertidal beach area throughout the plan period	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected	Policy (HTL): The HTL policy coupled with the NAI policy in PDZ 4 will maintain a sediment supply to areas located to the south off Hunstanton Cliffs, including Hunstanton beach itself, while there is no change to key tourism and recreation features. Therefore minor positive.
Landscape	<b>Landscape</b>	To maintain the integrity of the coastal landscape	Landscape	Will the SMP policy result in a change in the quality of the coastal landscape?	Quantitative judgement	Policy (HTL): The town of Hunstanton is a key feature in the coastal landscape; as such, the maintenance of defences will ensure that it is maintained in situ throughout the plan period. Therefore minor positive.
<b>Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types</b>						
Biodiversity, flora and fauna	<b>Flood and Erosion Risk Management</b>	Have as little flood and erosion risk management throughout the plan period as possible	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	Policy (HTL): SMP policy will maintain the current coastal processes, although this will prevent natural change. Flood and erosion risk management will be required throughout the plan period. Therefore minor negative.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>						
Water			Water	Will SMP policy result in changes to features covered by local WFD objectives?	Number of features covered by local WFD objectives impacted	Please refer to <b>Appendix M</b> (Appropriate Assessment)
<b>Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash</b>						
Cultural heritage, including architectural and archaeological heritage	<b>Timing</b>	Provide sufficient time, if required, for research of archaeological features	Historic environment	Will the SMP policy result in a change to designated and non-designated historic features?	Number of designated and non-designated historic features impacted	Policy (HTL): There are a number of Listed Buildings within Hunstanton which would be maintained through a HTL policy. As such, this is scored minor positive.

**Table 5 PDZ 4 Epochs 1, 2 & 3 (with HTL considered in epoch 3)**

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ4 (Hunstanton Cliffs)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Communities</b>	To maintain Hunstanton as a viable town, seaside resort and regional commercial centre throughout the plan period	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number	Policy (NAI): SMP policy within this PDZ is NAI throughout all epochs; as such, although the cliff line erodes naturally throughout all three epochs, no properties are expected to be lost. However, due to the migration of the cliff line landward, the erosion risk will increase. Hunstanton is maintained as a viable town, seaside resort and regional commercial centre throughout the plan period. Therefore, on balance, this is scored as neutral.
						Policy (HTL – epoch 3): A HTL policy would only be implemented if the cliff line erodes to the extent where properties would be lost. Erosion risk will be reduced and Hunstanton will be maintained as a viable town, seaside resort and regional commercial centre throughout the remaining period of the plan. Therefore, although the implementation of this policy would ensure that erosion risk to Cliff Parade does not increase, the fact that the implementation of a HTL policy would starve the coast to the south of sediment would therefore impact the maintenance of Hunstanton as a viable town, seaside resort and regional commercial centre throughout the plan period, this policy is scored, on balance as neutral.
Material assets	<b>Communities</b>	To protect as much of the existing development from cliff erosion as possible	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number	Policy (NAI): Under the time line of the SMP, no properties are expected to be lost to coastal erosion. However, due to the migration of the cliff line landward, the erosion risk will increase, although all current development will be protected. Therefore, on balance, this is scored as neutral.
						Policy (HTL – epoch 3): As stated above, a HTL policy would only be implemented if the cliff line erodes to the extent where properties would be lost. As such, within this option, all current development would be protected and the status quo maintained. Therefore, on balance, this is scored as minor positive.
	<b>Timing</b>	Provide sufficient time, if required, for change of flood risk management practices	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?		Policy (NAI): As the policy is NAI throughout the lifetime of the plan, sufficient time is allowed for change of flood risk management practices, if required. As stated previously, due to the migration of the cliff line landward the erosion risk will increase. Therefore, on balance, this is scored as neutral.
						Policy (HTL – epoch 3): Again, a HTL policy would only be implemented if the cliff line erodes to the extent where properties would be lost. Due to this policy only being implemented in epoch 3, sufficient time would allowed for change of flood risk management practices, if required. Therefore, on balance, this is scored as neutral.

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ4 (Hunstanton Cliffs)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>ROADS (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost	<p>Policy (NAI): Cliff Parade, which runs along the top of Hunstanton Cliffs, will be maintained in situ throughout the lifetime of the SMP. Erosion risk to Cliff Parade will increase throughout the SMP, although no transport connection will be interrupted throughout the plan period. Therefore on balance, this is scored as neutral.</p> <p>Policy (HTL – epoch 3): Should this policy be required to be implemented, Cliff parade will be maintained in situ and erosion risk will not be reduced. This is therefore scored, on balance, as neutral.</p>
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>						
Material assets	<b>Intertidal Beach</b>	To maintain the existing level of intertidal beach area throughout the plan period	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected	<p>Policy (NAI): The NAI policy will maintain a sediment supply to areas located to the south off Hunstanton Cliffs, including Hunstanton itself, while there is no change to key tourism and recreation features. Therefore minor positive.</p> <p>Policy (HTL – epoch 3): By its very nature, a HTL policy would limit the supply of sediment to the intertidal beach area, which would impact the tourism and recreation features of Hunstanton. As such, this is therefore scored as minor negative.</p>
Landscape	<b>Landscape</b>	To maintain the integrity of the coastal landscape	Landscape	Will the SMP policy result in a change in the quality of the coastal landscape?	Quantitative judgement	<p>Policy (NAI): The alternative would be to provide defences to the toe of the cliffs. The NAI policy also maintains a supply of sediment to the beach to the south, which would maintain the integrity of the coastal landscape to the south. Therefore minor positive.</p> <p>Policy (HTL – epoch 3): As described above, the implementation of a HTL policy would involve the provision of hard defences to the toe of the cliffs, causing a detrimental change in the coastal landscape. This is therefore scored as minor negative.</p>
<b>The loss of designated intertidal habitat located seaward of existing defences due to sea level rise</b>						
Biodiversity, flora and fauna	<b>Habitats</b>	Have as little flood and erosion risk management throughout the plan period as possible	Habitats and species	<p>Will SMP policy result in a change to conditions of European sites or habitats?</p> <p>Will SMP policy result in a change to SSSI condition?</p> <p>Will SMP policy result in a net change in priority BAP habitat extent?</p>	<p>Number of European sites and habitats impacted based on Habitats Regulations assessment.</p> <p>Number of SSSIs impacted.</p> <p>Amount of priority BAP habitat impacted</p>	<p>Policy (NAI): A NAI policy will ensure that an open face is maintained at Hunstanton Cliffs. Due to the nature of the policy, there will be no impact on European sites or habitats. There is no requirement for hard engineered structures. Minor positive.</p> <p>Policy (HTL – epoch 3): The provision of hard engineered structures would ensure a continued commitment to the provision of defences. This will also mean that an open face is not maintained at Hunstanton Cliffs. As the cliff line will move back beyond the Natura 2000 site boundary, there will be no impact on the N2K sites. On balance, therefore, minor negative.</p>
<b>Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types</b>						
Biodiversity, flora and fauna	<b>Flood and Erosion Risk Management</b>	Have as little flood and erosion risk management throughout the plan period as possible	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	<p>Policy (NAI): There will be no change in the operation of coastal processes, as the policy is currently NAI. There is no requirement for hard defences and no risk from inundation. Therefore minor positive.</p> <p>Policy (HTL – epoch 3): As the policy for the cliff line is currently NAI, the implementation of a HTL policy will result in a change in current coastal process, reducing the sediment supply to the south. There will also be a necessity for continued future flood risk management. Therefore this is scored minor negative.</p>

SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ4 (Hunstanton Cliffs)	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator	Assessment
Biodiversity, flora and fauna	Coastal Processes	To maintain natural processes relating to cliffs	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	<p>Policy (NAI): There will be no change in the operation of coastal processes and natural processes pertaining to cliffs will be maintained and promoted. Therefore minor positive.</p> <p>Policy (HTL – epoch 3): As the policy for the cliff line is currently NAI, the implementation of a HTL policy will reduce the natural processes relating to Hunstanton Cliffs and reducing the sediment supply to the south. Therefore this is scored minor negative.</p>
Biodiversity, flora and fauna	Coastal Processes	To prevent interruption of the role of cliff erosion in supplying sediment to the neighbouring Frontages (including Hunstanton beach)	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted	<p>Policy (NAI): The cliffs will continue to erode and supply sediment to the neighbouring frontages, with no change in coastal processes. Therefore minor positive.</p> <p>Policy (HTL – epoch 3): A HTL policy will reduce the role of cliff erosion in supplying sediment to neighbouring frontages (including Hunstanton beach). Therefore this is scored minor negative.</p>
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>						
Water			Water	Will SMP policy result in changes to features covered by local WFD objectives?	Number of features covered by local WFD objectives impacted	Please refer to <b>Appendix K</b> (WFD Assessment)
<b>Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash</b>						
Cultural heritage, including architectural and archaeological heritage	Timing	Provide sufficient time, if required, for research of archaeological features	Historic environment	Will the SMP policy result in a change to designated and non-designated historic features?	Number of designated and non-designated historic features impacted	<p>Policy (NAI): There are two Listed Buildings which are at risk of coastal erosion and which may be lost by the end of the third epoch. As such, this is scored as minor negative.</p> <p>Policy (HTL – epoch 3): The implementation of a HTL policy would result in time being allowed for research of archaeological features and would ensure that the two listed buildings at threat of erosion are not impacted. Therefore minor positive.</p>

**ANNEX II**  
**Summary of Consultation Responses**

## **Responses to consultation on the Scoping Report**

### **English Heritage**

English Heritage provided a verbal response by telephone on 9 July 2008 where they requested that it was made clear that heritage features include other features which are not designated or even 'discovered'.

Action - This was considered in the determination of this assessment and appropriate text added to several sections to reflect this.

### **Natural England**

Natural England provided a formal written response to the Scoping Report in a letter dated 8 May 2009. The letter provided agreement that the Scoping Report had correctly identified the major issues on the coastline, that the baseline did provide an appropriate level of detail and that the assessment criteria were appropriate.

This response also detailed matters relating to:

#### The cost of policy options in the assessment.

The need to identify that all policy options have a cost element and that MR policy is also likely to provide an additional ongoing commitment to maintenance and improvement, since MR is typically support be new defences.

Action - This is agreed and the text in table 1.2 has been amended accordingly.

#### The need to have regard to fisheries in the Wash

Natural England suggested that the SEA should have regard to the existing shellfishery in the Wash. It was also suggested that wildfowling should be mentioned as an activity.

Action – This matter was discussed with Natural England where it was agreed that no 'pathway' had been identified for SMP policy, which would be likely to effect shellfisheries. It follows therefore that the assessment of SMP policy in this context, is not considered appropriate.

#### The role of sediment supply to the Wash and its impact on shoreline morphology

Natural England provided an account of the degree to which the effect of policy would be assessed based on projections of future coastal response or observation on the effect of previous defences.

Action – Subsequent discussions have followed based on establishing the degree to which SMP policy or previous foreshore management impacts issues such as saltmarsh or mudflat extent in the Wash. This discussion has

shaped the consideration of policy options, based on the uncertainty which exists relating to how coastal processes operate as a system in this area.

#### Landscape Assessment

It was suggested by Natural England that the impacts of policy on the coastal landscape be supported by a quantitative/qualitative approach to assessment, rather than a simple qualitative assessment.

Action - Wherever possible this has been factored into the assessment process.

## **ANNEX III**

### **Consideration of the Effects of SMP Policy on Environmental Receptors**

Potential positive effects of SMP policy on SEA Environmental Receptors

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

SMP OPTION	POSITIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON S1 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
				integral element of habitat			saline or terrestrial habitat	saline or terrestrial habitat	
	Protects freshwater resources (e.g. abstractions & boreholes);		The protection of water abstraction sources						Protection of key community assets
	Protects economic assets located behind defences; and			The protection of agricultural land		Protection of key historical assets			Protection of key community assets
	Provides protection to ecological, cultural and historical assets landward of the defences.				Protection of key features in the coastal landscape	Protection of key historical assets	Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
<b>Managed realignment (MR)</b>	Coastal habitats allowed to move landwards under rising sea levels				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Creation of habitat to aid UKBAP; (United Kingdom Biodiversity Action Plan) and local BAP (Biodiversity Action Plan) targets;				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Habitat created for juvenile fish and other aquatic organisms (benefits to environment and fishing communities);						Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	Protects the viability of commercial and recreational fishing
	Reduces flood risk;								Protection of key community assets
	Promotes natural coastal processes;		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Contributes towards a more natural management of the coast; and		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	

SMP OPTION	POSITIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON S1 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
	Creation of high tide roosts and feeding areas.				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
<b>No active intervention (NAI)</b>	Coastal habitats allowed to move landwards under rising sea levels;				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Promotes natural coastal processes; and		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Contributes towards a more natural management of the coast.				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	

Potential negative effects of SMP Policy on SEA Environmental Receptors

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

SMP OPTION	NEGATIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON SI 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
	Increased coastal squeeze;				Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Interruption of coastal processes;		Adverse effects on water quality through turbidity changes etc.				Shifts in habitat functionality	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Effect on marine habitat;						Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	May increase rate of coastal erosion either side of the advanced line.		Adverse effects on water quality through turbidity changes etc.	Potential degradation of soil quality through intrusion	Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Impacts on other features important for community purposes
<b>Managed realignment (MR)</b>	Reduction in extent of habitat landwards of defences;				Shifts in the habitat mosaic as a function of the local landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Change in nature of habitat to landward of defence;				Shifts in the habitat mosaic as a function of the local landscape		Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Impact upon aquifers and abstractions;		Loss of abstraction points and intrusion into aquifers						Impacts on water supply to communities
	Loss of communities or community assets; and		Loss of abstraction points and intrusion into aquifers	Potential degradation of soil quality through intrusion			Loss of heritage features		Reduction in the amenity of coastal communities

SMP OPTION	NEGATIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON SI 1633)								
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES	
	Loss of heritage and cultural features;						Loss of heritage features		Reduction in the amenity of coastal communities	
	Loss of agricultural land			Loss of agricultural land/soil				Impacts on the character of local communities and the local economy		
<b>No active intervention (NAI)</b>	Lack of certainty of effects and time for adaptation;							Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Provision of community features in unsustainable locations
	Increased risk of inundation to landward habitats under rising sea levels;						Loss of known or undiscovered archaeological resources	Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Impact upon aquifers and abstractions;		Loss of abstraction points and intrusion into aquifers							Impacts on water supply to communities
	Loss of communities or community assets; and		Loss of abstraction points and intrusion into aquifers	Loss of agricultural land/soil			Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of heritage and cultural features.					Loss of heritage features			Reduction in the amenity of coastal communities	

**ANNEX IV**  
**Scoping Study**

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## L1 INTRODUCTION AND BACKGROUND

**This section includes:**

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

### L1.1 Why we are using Strategic Environmental Assessment (SEA)

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

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

Under Directive 2001/42/EC of the European Parliament and European Council on the assessment of the effects of certain plans and programmes on the environment, a strategic environmental assessment (SEA) must be undertaken for plans and programmes that are required by legislative, regulatory or administrative provisions. 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. As a result Defra (2006) recommended that operating authorities assess policies using the approach described in the Directive. The legislative act which transposes the Directive into domestic law is the Environmental Assessment of Plans and Programmes Regulations (SI 1633, 2004). The main aim of the EU Directive is to "*provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development*".

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

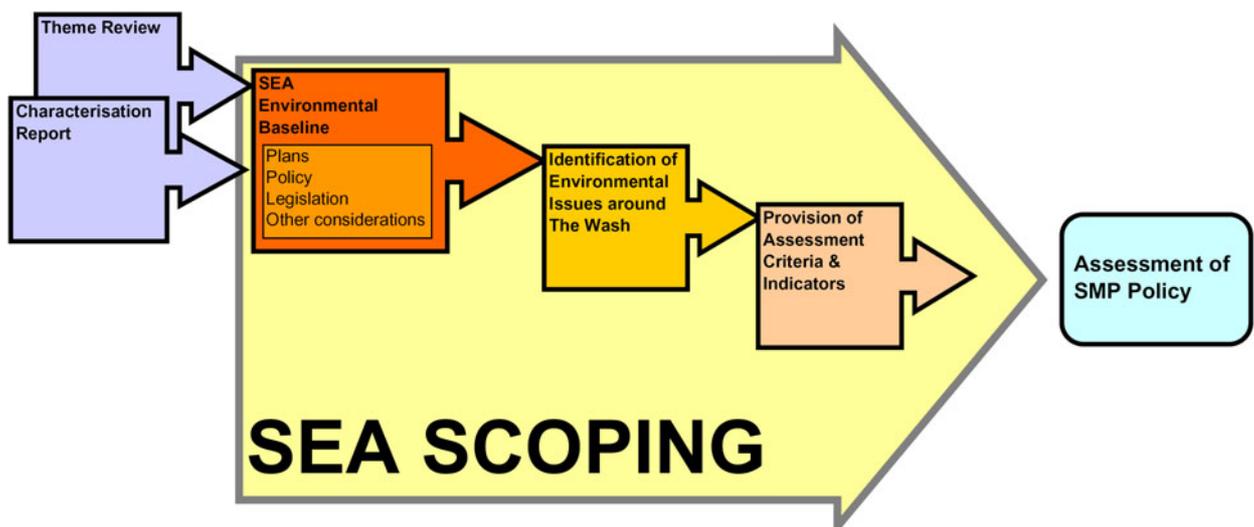
During the preparation of this document we have utilised, were applicable, the guidance provided by the following:

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

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

## L1.2 The SMP context for the SEA

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



The SEA process to accompany the production of the SMP is intended to ensure that consideration of the environmental issues relating to the coast is central to the development and evaluation of policy. This SMP therefore provides the mechanism to support a structured evaluation of the environmental issues relating to the coastline of The Wash and to develop assessment criteria which are focussed on these issues. The evaluation of

policy can therefore be shaped and evaluated in a targeted, specific manner. The following sections summarise the approach taken to this task, and how environmental issues have been identified and structured into assessment criteria.

**This section explains the SEA process including:**

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

Within this SEA scoping report and in a manner analogous to that used throughout the SMP process (Defra, 2006) the term environment is used to cover (as defined by SI 1633):

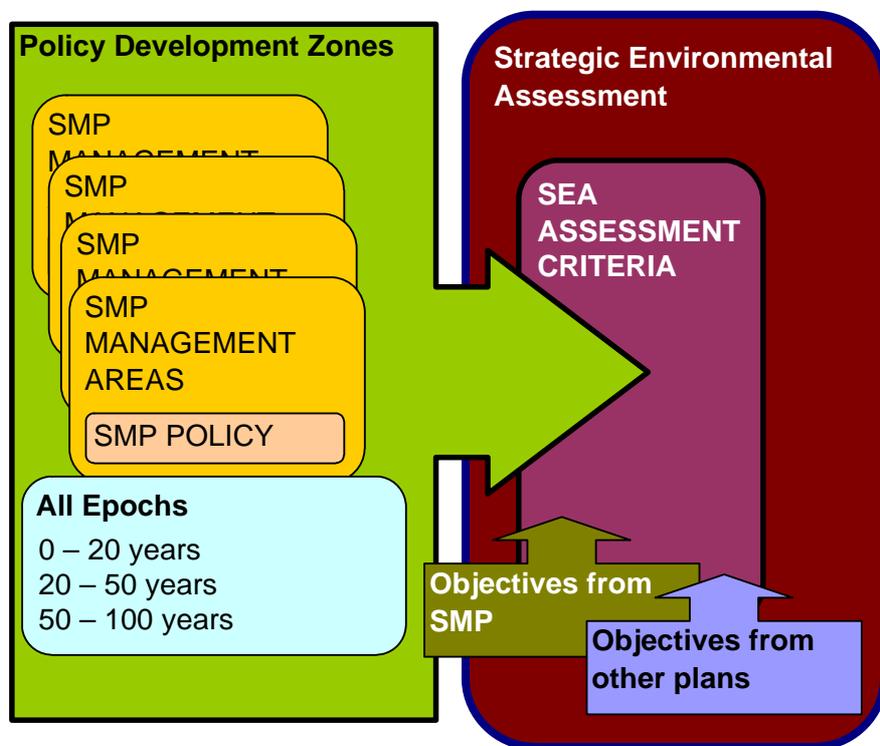
- Biodiversity, fauna and flora;
- Population and human health;
- Material assets;
- Soil;
- Water;
- Air;
- Climatic factors;
- Cultural heritage, including architectural and archaeological heritage; and
- Landscape.

In considering the effects on the environment in the SEA, assessment criteria will reflect the key environmental issues within the SMP area.

The SEA will follow a simple programme which combines the specifics of the SMP process with the stages of a SEA provided in the guidance suite. The SEA will therefore be used to determine the potential effects of policy options on the environment of The Wash (with a specific focus on key environmental issues).

The purpose of this scoping stage is to establish the environmental baseline (including key environmental issues) and clarify the **assessment criteria** which will provide the basis for the assessment of **SMP policy**. These will

then be considered during the course of producing the SMP (i.e. the evaluation of SMP policy options).



A suite of **assessment criteria** for the SMP process will be developed in this report, based on a review of pertinent plans, policy, legislation and other environmental factors. This review will be provided in the context of the environmental baseline for the assessment. The key sources of information within this process were the Theme Review, RCZA and Site Characterisation reports, which were developed as a key component of the SMP process. These reports provide a detailed account of all the features located in the coastal zone (social, economic and environmental) and provide the basis for considering the key issues facing shoreline management in this area. Additionally other plans will be identified and evaluated to establish whether additional objectives are required to meet wider environmental issues.

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

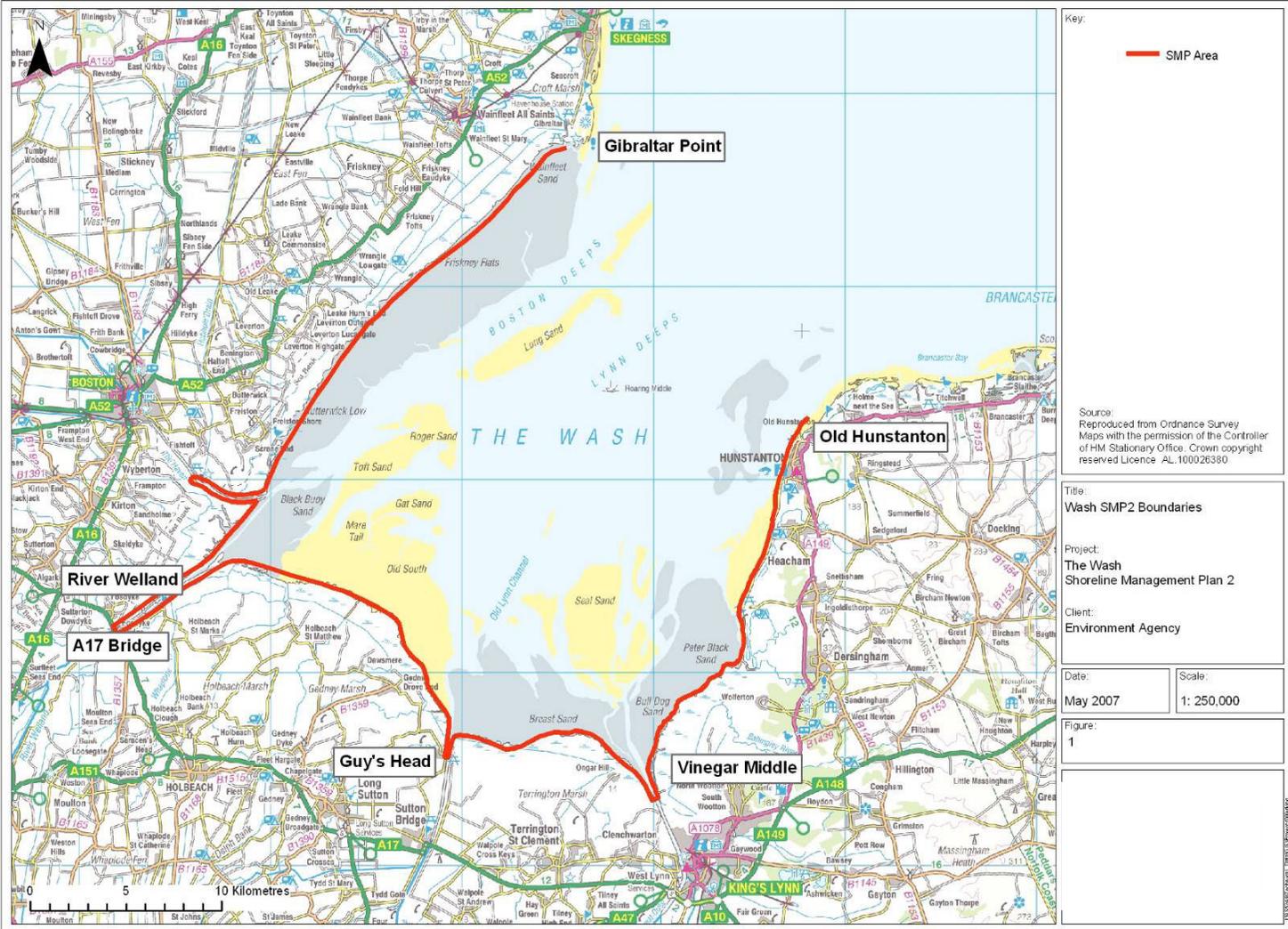
### L1.3 Study area

The Wash Shoreline Management Plan (SMP) study area encompasses the coastal hinterland surrounding The Wash estuary which is bounded on the landward side by major roads (A52, A16, A17 and A148) as illustrated in **Figure 1.1** (and as defined in the Theme Review). This area is referred to in this document as the 'playing field', since this has become the spatial focus

of the development of SMP policy and consideration of their potential impacts.

The SMP identifies areas potentially at risk from coastal flooding or erosion or physical coastal change over the next 100 years. However, the flat, low-lying nature of The Wash hinterland means that significant areas are prone to coastal erosion and coastal flooding in the absence of these defences. Examination of the 1 in 1000 year flood area indicates that this extends for a significant area inland, well beyond many existing settlements and infrastructure. With respect to this, the area of study for this SEA scoping report has therefore been defined as that lying within the primary main roads encircling the Wash, with these being the A 52 and A 16 to the west of The Wash; to the south of the Wash, the A 17; and the A 149 to the east of the Wash. These main roads tend to follow the more significant settlements in the SMP study area and although this does have the disadvantage of major settlements (e.g. Boston, Kirton) being divided by the boundary, it represents a clear and pragmatic boundary within which focussed assessment of features has been undertaken.

Figure 1: Wash SMP2 boundaries



## L1.4 Scope and Structure of the Document

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

The sections in this Strategic Environmental Assessment scoping report are as follows:

**Section One** introduces this document and sets the context for the use of SEA within the SMP process. In addition, this section explains the rationale behind the SMP itself and describes the implications of the SMP on the wider environment. Within this section, the context and methodology for the SEA, including prediction and evaluation methodology is discussed.

**Section Two** provides the baseline data associated with The Wash, including pertinent policies and legislation.

**Section Three** describes the relevant environmental issues and presents the derived assessment criteria.

**Section Four** presents the approach for consultation and describes how key issues raised through the consultation process will be considered within the SEA process.

**Section Five** provides an account of upcoming steps in this SEA process, as it aligns itself with the production of the SMP.

**Section Six** provides references for this document.

**Appendix A** presents plans and policy pertinent to the SEA process.

**Appendix B** presents legislation pertinent to the SEA process.

**Appendix C** presents information pertaining to sites of conservation importance within the study area.

**Appendix D** presents further baseline information.

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

## 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. A SMP aims to manage risk through the utilisation of a range of methods which reflect both national and local priorities, to (Defra, 2006):

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

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

The objectives of a 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 or erosion risks are high; and

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

- Meet international and national nature conservation legislation and aim to achieve the biodiversity objectives.

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

**Table 1.1 Options used in SMP development**

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

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

#### L1.5.2 Implications of SMP policy on the wider environment

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

**Table 1.2 Potential generic implications of each SMP option**

SMP option	Positive impacts	Negative impacts
Hold the line (HtL)	<ul style="list-style-type: none"> <li>• Protects communities and infrastructure located within the coastal flood zone;</li> <li>• Protects 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 within 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>• Protects communities and infrastructure located within the coastal flood zone;</li> <li>• Protects 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>• Reduces extent of coastal habitat;</li> <li>• Change in functionality of habitat;</li> <li>• Increased coastal squeeze;</li> <li>• Interrupts 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>

SMP option	Positive impacts	Negative impacts
Managed realignment (MR)	<ul style="list-style-type: none"> <li>• Coastal habitats allowed to move landwards under rising sea levels</li> <li>• Creates 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>• Creates high tide roosts and feeding areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces 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; and</li> <li>• Loss of historic and cultural features;</li> </ul>
No active intervention (NAI)	<ul style="list-style-type: none"> <li>• Coastal habitats allowed to move landwards under rising sea levels; <ul style="list-style-type: none"> <li>• Promotes natural coastal processes; and</li> </ul> </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; <ul style="list-style-type: none"> <li>• Loss of communities or community assets; and</li> </ul> </li> <li>• Loss of historic and cultural features.</li> </ul>

## L2 BASELINE DATA

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

The Theme Review (Royal Haskoning, 2007a), Coastal Characterisation (Royal Haskoning, 2007b) and Rapid Coastal Zone Assessment (RCZA) update (Royal Haskoning, 2008c) which were produced as part of the SMP process, have been used as a key source of baseline data in shaping the consideration of environmental issues. The SMP process requires a detailed assessment of the key features of the coastline, and the Theme Review and Characterisation reports provide a tabulated and narrative based account of this. Accordingly the Theme Review (which incorporates the RCZA) should be considered by extension, a critical element of the SEA process.

During the consultation process on this SEA Scoping Report, any additional information considered relevant to this assessment by the statutory consultees and not included with this assessment will be collected and incorporated (i.e. information not covered in the work described above). With respect to this, if there is information missing which can be supplied by the statutory consultees, then the statutory consultees are requested to provide this information as part of the scoping process. The following section describes the key features and legislation considered within the assessment, with the main subject areas for data collection being presented below:

- Pertinent policy relating to The Wash coastline;
- Legislation relating to the management of The Wash;
- Designations for environmental reasons relating to The Wash coastal area; and
- Wider environmental issues considered central to SMP policies.

Baseline data has been provided in the following sections, based upon the themes which have emerged in the course of producing the SMP and the receptors identified in the SEA guidance (ODPM, 2005). The collation of data in this manner is representative of the issues identified within the SEA area and aids understanding of the relationship between receptors. For each heading, the relevant receptors have been identified from the list of receptors provided in Defra guidance (Defra, 2005) and specified in **Section 5**.

## L2.1 Air Quality

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

## L2.2 Water

### L2.2.1 Designated shellfish waters 2004

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

- West Wash;
- North East Wash; and
- South East Wash.

The main species farmed within The Wash are *Cerastoderma edule* (Common cockle) and *Mytilus* spp. (Common mussel) (FSA, 2009). **Table 2.1** presents the main production areas and beds, as well as the species associated with those beds.

**Table 2.1 Production areas, bed names and bivalve mollusc species farmed in The Wash embayment (FSA, 2009)**

Production Area	Bed name	Species
The Wash – Boston	Zone 1 North: Butterwick Wrangle Fiskney	<i>C. edule</i>
	Zone 1 South: Witham Bank/North Lays	<i>Mytilus</i> spp.
	Zone 2 East: Maretail Tofts Ridge Tofts South Gat Sand Toft Lays Herring Hill Black Buoy	<i>C. edule</i> <i>Mytilus</i> spp.

Production Area	Bed name	Species
The Wash – Kings Lynn	Holbeach (formerly Nene)	
	Welland Wall	<i>Mytilus</i> spp.
	Zone 3: Thief Breast Sand Breast Sand (Inner West Mark Knock) Daseleys	<i>C. edule</i>
	Zone 3: Scotsman's Sled Thief Breast Sand Daseleys	<i>Mytilus</i> spp.
	Zone 4 North: Heacham	<i>C. edule</i>
	Zone 4 North: Hunstanton	<i>Mytilus</i> spp.
	Zone 4 South: Ferrier Sand Pandora Stylemans South Daseleys	<i>C. edule</i> <i>Mytilus</i> spp.

### L2.2.2 Hydrology & water resources

The river catchments within The Wash CAMS comprise of the Rivers Witham, Welland, Nene and Great Ouse. The catchments around The Wash are a critical element in determining the physical form and evolution of the coast.

The drainage basin of the Wash includes the major aquifers of the East Anglian Chalk and Lincolnshire Limestone as well as locally important aquifers in Bedfordshire (Lower Cretaceous Greensand) and North West Norfolk (chalk and crag overlain by varying thicknesses of Quaternary sands and gravels). These have all been extensively developed for public water supplies.

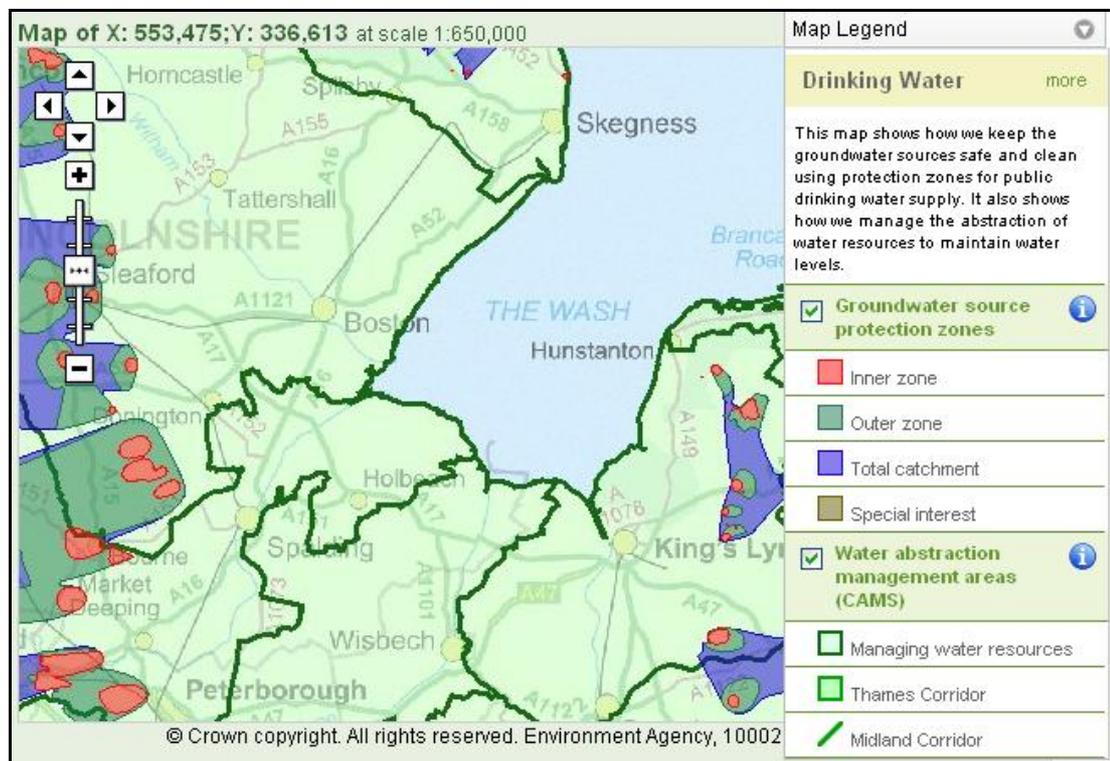
Rivers (and their reaches) are scored depending upon their sensitivity to abstraction and current usage. Catchment Area Management Strategies have been produced for the Rivers Witham, Welland, Nene, Ouse (Cam, Ely and Ouse). The strategies provide an account of the overall abstraction relative to wider requirements in regard to ecological functions etc at a reach based level. This level of detail is not appropriate to this assessment since the overall levels of abstraction for the catchment are not readily identifiable.

### L2.2.3 Borehole and water abstraction

There are no groundwater protection zones within the SMP area, the closest being in north-west Norfolk, close to the village of Sedgeford and approximately 4 miles east of Hunstanton. **Figure 2.1** presents groundwater protection areas within the wider Wash area (Environment Agency, 2009).

As is shown in **Figure 2.1**, groundwater protection zones in this area are limited in extent and located some distance from the coast. It is therefore considered unlikely that SMP policy will have a significant impact upon this resource.

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



### L2.3 Landscape

The Wash is the largest estuarine system in the UK and forms a largely shallow marine embayment into which the Rivers Ouse, Welland, Witham and Great Ouse drain before flowing into the North Sea. Marine processes dominate the physical and biological character of the site. As well as its large-scale sub and intertidal habitats, the Wash has a number of valuable fringing habitats of conservation significance including saline lagoons, shingle structures and dune complexes.

More land has been reclaimed from The Wash than any other British estuary with large amounts of swamp and marshland having been reclaimed through drainage and embankment that began in Roman times. It is estimated that in the region of 82,000 hectares of land has been claimed from The Wash since Saxon times with observations of recent shoreline retreat likely to be evidence that reclamation has exceeded the level that can be sustained.

### 2.3.1 Area of Outstanding Natural Beauty (AONB)

The North Norfolk Coast was designated as an Area of Outstanding Natural Beauty (AONB) in 1968. The designated area covers a total of 450 km<sup>2</sup>, and stretches from Hunstanton to Bacton, but does not include the settlements of Cromer and Sheringham, or the land between them. The Norfolk Coast AONB is partially included within the study area as the western outlier part is within The Wash. This area comprises the area immediately north-east of the confluence of the River Great Ouse with The Wash and is characterised by intertidal mudflats, saltmarsh, lowland heath and Bog, and farmland (North Norfolk Coast AONB, 2007).

The western segment lies to the north of Kings Lynn and includes the Wash mudflats as well as lowland marshes, heathland and bog. It also includes part of the Sandringham estate.

The North Norfolk Coast AONB Management Unit produced a Management Plan in 2004 which seeks to co-ordinate the actions of the organisations that make up the AONB Partnership, while setting a framework for any organisation or individual whose activities will have an impact on the objectives for the area. The Management Plan 2004-2009 provides a framework for management of the area for partner organisations, and guidance for other organisations and individuals, to achieve conservation and enhancement of the natural beauty of the area. The plan details the legislative background, the special qualities of the area and details of how the management of the area will be undertaken. It sets out issues under a number of theme headings along with objectives for each theme. The objectives are then included in the AONB Action Plan which describes how they will be achieved.

## L2.4 Coastal processes and reclamation

Prior to the extensive land claim and associated construction of tidal flood embankments, The Wash embayment was significantly larger than the present day and incorporated much of present-day Fenland.

The diversion of freshwater which occurred following the drainage of the Fens resulted in increased siltation within The Wash embayment due to the reduction in fluvial flushing. This led to extensive salt marsh development in

the western section of the embayment which later spread until an extensive strip of around 4km in width had accreted in front of the Sea Bank. The most major phase of land claim in The Wash initially focused on this area of salt marsh, commencing in the mid-17<sup>th</sup> century. Since that time some 320km<sup>2</sup> of The Wash has been turned into agricultural land, continually changing the position of the shoreline in the process. The impact of historic reclamation is detailed below:

- The shoreline position of The Wash has changed artificially and significantly over time;
- The land claiming process has tended to promote progradation of the fronting salt marsh (Kestner, 1962; 1963, cited in Royal Haskoning, 2008b). This has led to a net reduction in overall inter-tidal mud flat and sand flat area, thereby compressing the succession of salt marsh, mud flat and sand flat into a narrower zone;
- The former inter-tidal area claimed by the embankment stops benefiting from the deposition of marine sediment, whilst this process continues on the seaward side. This has led over time to quite substantial topographic differential between seaward and landward sides of the embankment; and
- The material used to construct the land-claiming embankments was generally sourced from 'borrow-pits' on the seaward side of the embankment (Osborne and French, undated, cited in Royal Haskoning, 2008b).

A moratorium against further land claim in The Wash has been established within planning policies over recent decades. The last land claim in The Wash was in the mid 1980s at Wash Banks. In reversal of the historic trend of land claim, a section of embankment near North Sea Prison Camp was breached in August 2002 and returned to tidal inundation in the form of a managed realignment scheme.

## **L2.5 The historic environment**

### **L2.5.1 Scheduled Ancient Monuments (SAM)**

There are 120 Scheduled Ancient Monuments (SAMs) in the West Norfolk and Kings Lynn District Council administrative area and 478 in Lincolnshire. Of these, seven in Kings Lynn and West Norfolk District and 43 in Lincolnshire are cited by English Heritage (NDS, 2008) as being at risk. Although protected by law, scheduled monuments are threatened by a wide range of human activities and natural processes. SAMs within the study area are presented in **Table 2.2**.

**Table 2.2 Scheduled Ancient Monuments within the 1 in 1000 year flood zone (MAGIC, 2008)**

Scheduled Monument Number	Name / Description	Easting	Northing	Area (Ha)
31609	Wyberts Castle, medieval moated site	533565.529526	341010.611268	3.3
22673	Churchyard cross, All Saints churchyard	531511.55599	333306.402847	0.001
22671	Churchyard cross, St James' churchyard	537631.70527	343792.338781	0.001
31121	Cross in St Margaret's churchyard	558926.736827	320196.762281	0.001
NF404	Remains of tower on Lodge Hill	566825.857119	333859.06668	
31610	Multon Hall moated site	533901.404458	337939.008037	4.3
31625	Hussey Tower	533084.626	343631.5105	0.007
20823	Medieval settlement remains North of Kenwick Farm House	556969.817053	319042.449327	2.2

Further information pertaining to the historic environment can be found in both the Theme Review (Royal Haskoning, 2007a) and the RCZA update (Royal Haskoning, 2008c).

#### L2.5.2 Conservation areas

A conservation area is described as "*an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance*". Under Section 69 of the Planning (Listed Buildings and Conservation Areas) Act, 1990, every Local Planning Authority throughout the country has a duty to determine which parts of its area fit this description and then designate these as conservation areas. The aim of a conservation area is primarily to maintain groups of buildings and their settings (i.e. the collective character of an area) as opposed to the preservation of individual buildings. The latter comes under the protection of the Listed Building legislation which can be found in Part I of the 1990 Planning Act. Conservation areas within the Wash SMP SEA study area are presented in **Table 2.3**.

**Table 2.3 Conservation areas along the Wash SMP SEA study area and lying wholly or partially within the study area.**

District Council	Conservation areas within the SMP study area
East Lyndsey District Council (17 in total)	None
Boston Borough Council (11 in total)	Boston Town
	Boston Skirbeck
	Boston Spilsby Road
	Frampton
	Kirton
	Wrangle
South Holland District Council (13 in total)	Gedney Dawsmere
	Fleet Hargate
Kings Lynn & West Norfolk District Council (42 in total)	Heacham

Further background information on the coastline of The Wash which has been used in this assessment is provided as **Appendix D**, with more detailed information being available in the North Norfolk RCZA update (Royal Haskoning, 2008c).

## L2.6 Habitats & species

### L2.6.1 Statutory International Designations

The area of land within The Wash embayment which is below sea level and prevented from coastal inundation is significant; however, in recognition of the likely practical constraints on shoreline management options, this SEA document will focus on International sites within the study area, as defined in **Section 1.3**. Internationally designated sites concentrated around The Wash embayment itself and within the study area are presented in **Table 2.4** and **Figure 2.2**.

The Wash is comprised of extensive saltmarshes, large intertidal banks of mud and sand, shallow waters and deep channels. The intertidal mud and sand flats are home to a rich variety of invertebrate fauna. The sheltered nature of The Wash and its expansive marshes and intertidal habitats make it an exceptionally important site for large numbers of geese, waders and ducks throughout the year. Notable species include the Marsh harrier (*Circus aeruginosus*), Knot (*Calidris canutus islandica*) and Common redshank (*Tringa totanus totanus*). Its sheltered nature also provides good

conditions for shellfish which provide an important food source for breeding birds such as the oystercatcher. In addition to this, The Wash holds one of the North Sea's largest breeding populations of common seal as well as a smaller number of grey seals. The sublittoral area supports a number of different marine communities including colonies of the reef-building polychaete worm *Sabellaria spinulosa*.

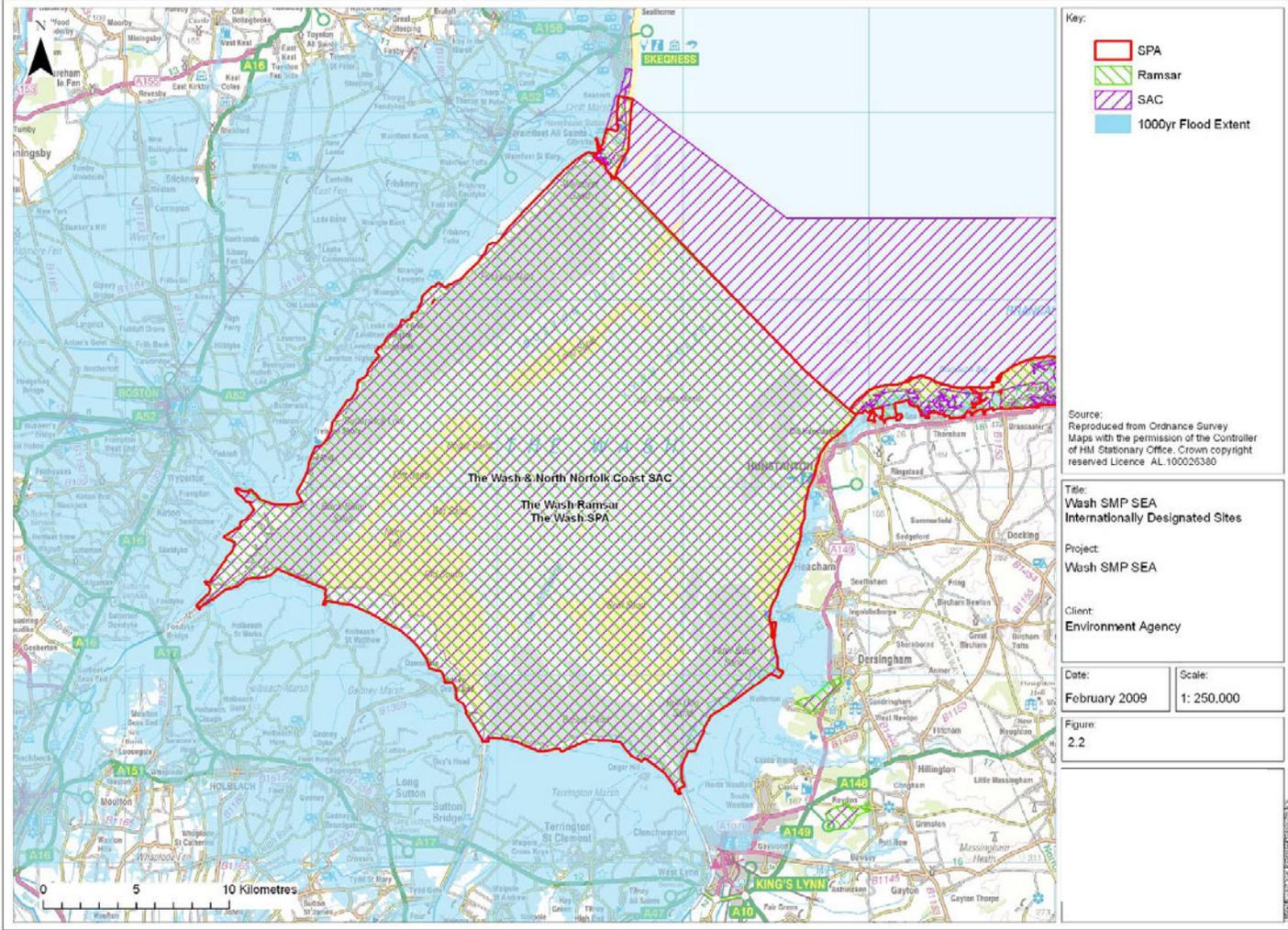
Nature conservation designations seek to conserve areas of conservation importance and the habitats and species which are the basis of their statutory designation. However, as the designations are derived from discrete and different pieces of legislation, each therefore varies in the nature and mechanisms of their protection. The inherently dynamic nature of coastal environments and the potential of flood risk management structures and practices to both constrain (e.g. by holding or advancing the line) and create (e.g. from no active intervention or managed realignment) habitat ensures that SMP policy has a highly significant bearing on both natural habitats and designated sites.

**Table 2.4 Internationally designated sites within or adjacent to the study area**

International site type	Legislation site designated under	Site name	Area (ha)
Ramsar	Ramsar Convention	North Norfolk Coast	7862
		The Wash	62211
		Gibraltar Point	414
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)	The Wash & North Norfolk Coast	107761
		North Norfolk Coast	3208
		Saltfleetby-Theedlethorpe Dunes & Gibraltar Point SAC	968
Special Protection Area (SPA)	Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive)	The Wash	62211
		North Norfolk Coast	7887
		Gibraltar Point	422

**Tables 2.5 – 2.13** present the qualifying features for all statutory internationally designated sites within The Wash SMP SEA area. Further information pertaining to these sites is presented in **Appendix C**. **Figure 2.2** presents an overview of the internationally designated conservation areas along The Wash SMP study area.

**Figure 2.2 Wash SMP SEA internationally designated sites**



## L2.6.2 Ramsar sites

**Table 2.5 Qualifying features of the North Norfolk Coast Ramsar (JNCC, 2008a)**

<b>Qualifying features for the North Norfolk Coast Ramsar (JNCC, 2008a)</b>
<i>Ramsar criterion 1</i>
The site is one of the largest expanses of undeveloped coastal habitat of its type in Europe.
<i>Ramsar criterion 2</i>
The site supports at least 3 British Red Data Book and nine nationally scarce vascular plants, 1 British Red Data Book lichen and 38 British Red Data Book invertebrates.
<i>Ramsar criterion 5</i>
Assemblages of international importance: 98462 waterfowl (5 year peak mean 1998/99-2002/2003)
<i>Ramsar criterion 6</i>
Qualifying species/populations occurring at levels of international importance (as identified at designation): <b>Species regularly supported during the breeding season:</b> <ul style="list-style-type: none"> <li>• Sandwich tern <i>Sterna sandvicensis sandvicensis</i></li> <li>• Common tern <i>Sterna hirundo hirundo</i></li> <li>• Little tern <i>Sterna albrifrons albrifrons</i></li> </ul> <b>Species with peak counts in spring/autumn:</b> <ul style="list-style-type: none"> <li>• Red knot <i>Calidris canutus islandica</i></li> </ul> <b>Species with peak counts in winter:</b> <ul style="list-style-type: none"> <li>• Pink-footed goose <i>Anser brachyrhynchus</i></li> <li>• Dark-bellied Brent goose <i>Branta bernicla bernicla</i></li> <li>• Eurasian wigeon <i>Anas Penelope</i></li> <li>• Northern pintail <i>Anas acuta</i></li> </ul>

**Table 2.6 Qualifying features of The Wash Ramsar (JNCC, 2008b)**

<b>Qualifying features for The Wash Ramsar (JNCC, 2008b)</b>
<i>Ramsar criterion 1</i>
The Wash is a large shallow bay comprising very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels.
<i>Ramsar criterion 3</i>
Qualifies because of the inter-relationship between its various components including saltmarshes, intertidal sand and mud flats and the estuarine waters. The saltmarshes and the plankton in the estuarine water provide a primary source of organic material which, together with other organic matter, forms the basis for the high productivity of the estuary.
<i>Ramsar criterion 5</i>
Assemblages of international importance: 292541 waterfowl (5 year peak mean 1998/99-2002/2003)

<b>Qualifying features for The Wash Ramsar (JNCC, 2008b)</b>
<i>Ramsar criterion 6</i>
Qualifying species/populations occurring at levels of international importance (as identified at designation): <b>Species with peak counts in spring/autumn:</b> <ul style="list-style-type: none"> <li>• Eurasian oystercatcher <i>Haematopus ostralegus ostralegus</i></li> <li>• Grey plover <i>Pluvialis squatarola</i></li> <li>• Red knot <i>Calidris canutus islandica</i></li> <li>• Sanderling <i>Calidris alba</i></li> <li>• Eurasian curlew <i>Numenius arquata arquata</i></li> <li>• Common redshank <i>Tringa totanus totanus</i></li> <li>• Ruddy Turnstone <i>Arenia interpres interpres</i></li> </ul> <b>Species with peak counts in winter:</b> <ul style="list-style-type: none"> <li>• Pink-footed goose <i>Anser brachyrhynchus</i></li> <li>• Dark-bellied Brent goose <i>Branta bernicla bernicla</i></li> </ul>

**Table 2.7 Qualifying features of the Gibraltar Point Ramsar (JNCC, 2008c)**

<b>Qualifying features for the Gibraltar Point Ramsar (JNCC, 2008c)</b>
<i>Ramsar criterion 1</i>
The dune and saltmarsh habitats present on the site are representative of all the stages of colonization and stabilisation. There is a fine example of freshwater marsh containing sedges <i>Carex</i> spp., rushes <i>Juncus</i> spp., and ferns, including adder's-tongue fern <i>Ophioglossum vulgatum</i> . Also most northerly example of nationally rare saltmarsh/dune communities containing sea heath <i>Frankenia laevis</i> , rock sea lavender <i>Limonium binervosum</i> and shrubby seablite <i>Suaeda vera</i> .
<i>Ramsar criterion 2</i>
Supports an assemblage of wetland invertebrate species of which eight species are listed as rare in the British Red Data Book and a further four species listed as vulnerable.
<i>Ramsar criterion 5</i>
Assemblages of international importance: 53072 waterfowl (5 year peak mean 1998/99-2002/2003)
<i>Ramsar criterion 6</i>
Qualifying species/populations occurring at levels of international importance (as identified at designation): <b>Species with peak counts in spring/autumn:</b> <ul style="list-style-type: none"> <li>• Grey plover <i>Pluvialis squatarola</i>;</li> <li>• Sanderling <i>Calidris alba</i>;</li> <li>• Bar-tailed godwit <i>Limosa lapponica lapponica</i>; and</li> <li>• Red Knot <i>Calidris canutus islandica</i>.</li> </ul> <b>Species with peak counts in winter:</b> <ul style="list-style-type: none"> <li>• Dark-bellied Brent goose <i>Branta bernicla bernicla</i></li> </ul>

### L2.6.3 Special Areas of Conservation (SAC)

**Table 2.8 Qualifying features of The Wash and North Norfolk Coast SAC site (JNCC, 2008d)**

Qualifying features for The Wash and North Norfolk Coast SAC site (JNCC, 2008d)	
Qualifying feature	Description
<i>Annex I habitats that are a primary reason for selection of this site</i>	
	<ul style="list-style-type: none"> <li>• Sandbanks that are slightly covered by seawater all the time;</li> <li>• Mudflats and sandbanks not covered by seawater at low tide;</li> <li>• Large shallow inlets and bays;</li> <li>• Reefs;</li> <li>• <i>Salicornia</i> and other annuals colonising mud and sand;</li> <li>• Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>);</li> <li>• Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>).</li> </ul>
<i>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</i>	
Coastal lagoons	
<i>Annex II species that are a primary reason for the selection of this site</i>	
Common Seal <i>Phoca vitulina</i>	
<i>Annex II species that are present as a qualifying feature, but not a primary reason for site selection</i>	
Otter <i>Lutra lutra</i>	

**Table 2.9 Qualifying features of the North Norfolk Coast SAC site (JNCC, 2008e)**

Qualifying features for North Norfolk Coast SAC site (JNCC, 2008e)	
Qualifying feature	Description
<i>Annex I habitats that are a primary reason for selection of this site</i>	
	<ul style="list-style-type: none"> <li>• Coastal lagoons;</li> <li>• Perennial vegetation of stony banks;</li> <li>• Mediterranean and thermo-Atlantic halophilous scrubs;</li> <li>• Embryonic shifting dunes;</li> <li>• Shifting dunes along the shoreline with <i>Ammophila aernaria</i>;</li> <li>• Fixed dunes with herbaceous vegetation; and</li> <li>• Humid dune slacks.</li> </ul>
<i>Annex II species that are present as a qualifying feature, but not a primary reason for site selection</i>	
Otter <i>Lutra lutra</i>	
Petalwort <i>Petalophyllum ralfsii</i>	

**Table 2.10 Qualifying features of the Saltfleetby-Theedlethorpe Dunes & Gibraltar Point SAC (JNCC, 2008f)**

<b>Qualifying features for the Saltfleetby-Theedlethorpe Dunes and Gibraltar Point SAC site (JNCC, 2008f)</b>	
<b>Qualifying feature</b>	<b>Description</b>
<i>Annex I habitats that are a primary reason for selection of this site</i>	
	<ul style="list-style-type: none"> <li>• Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes');</li> <li>• Fixed dunes with herbaceous vegetation ('grey dunes');</li> <li>• Dunes with <i>Hippophae rhamnoides</i>;</li> <li>• Humid dune slacks</li> </ul>
<i>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</i>	
	Embryonic shifting dunes

L2.6.4 Special Protection Areas (SPA)

**Table 2.11 Qualifying features of The Wash SPA (JNCC, 2008g)**

<b>Qualifying features for The Wash SPA (JNCC, 2008g)</b>	
<i>Article 4.1 Qualification (79/409/EEC)</i>	
<b><i>During the breeding season the area regularly supports:</i></b>	
	<ul style="list-style-type: none"> <li>• Little tern <i>Sterna albifrons</i>; and</li> <li>• Common tern <i>Sterna hirundo hirundo</i></li> </ul>
<b><i>Over winter the area regularly supports:</i></b>	
	<ul style="list-style-type: none"> <li>• Bewick's Swan <i>Cygnus columbianus bewickii</i>: and</li> <li>• Bar-tailed Godwit <i>Limosa lapponica</i>.</li> </ul>
<i>Article 4.2 Qualification (79/409/EEC)</i>	
<b><i>Over winter the area regularly supports:</i></b>	
	<ul style="list-style-type: none"> <li>• Pintail <i>Anas acuta</i>;</li> <li>• Eurasian wigeon <i>Anas Penelope</i>;</li> <li>• Gadwall <i>Anas strepera</i>;</li> <li>• Pink-footed goose <i>Anser brachyrhynchus</i>;</li> <li>• Ruddy Turnstone <i>Arenaria Interpres</i>;</li> <li>• Brent Goose <i>Branta bernicla bernicla</i>;</li> <li>• Common goldeneye <i>Bucephala clangula</i>;</li> <li>• Sanderling <i>Calidris alba</i>;</li> <li>• Dunlin <i>Calidris alpina alpina</i>;</li> <li>• Common oystercatcher <i>Haematopus ostralegus</i>;</li> <li>• Black-tailed Godwit <i>Limosa limosa islandica</i>;</li> <li>• Common Scoter <i>Melanitta nigra</i>;</li> <li>• Curlew <i>Numenius arquata</i>;</li> <li>• Grey plover <i>Pluvialis squatarola</i>;</li> <li>• Shelduck <i>Tadorna tadorna</i>; and</li> <li>• Redshank <i>Tringa totanus</i>.</li> </ul>

**Table 2.12 Qualifying features of the North Norfolk Coast SPA (JNCC, 2008h)**

<b>Qualifying features for the North Norfolk Coast SPA (JNCC, 2008h)</b>
<i>Article 4.1 Qualification (79/409/EEC)</i>
<b>During the breeding season the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Bittern <i>Botaurus stellaris</i>;</li> <li>• Marsh harrier <i>Circus aeruginosus</i>;</li> <li>• Avocet <i>Recurvirostra avosetta</i>;</li> <li>• Little tern <i>Sterna albrifrons</i>;</li> <li>• Little tern <i>Sterna hirundo</i>; and</li> <li>• Sandwich tern <i>Sterna sandvicensis</i>.</li> </ul> <b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Avocet <i>Recurvirostra avosetta</i>.</li> </ul>
<i>Article 4.2 Qualification (79/409/EEC)</i>
<b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Eurasian wigeon <i>Anas Penelope</i>;</li> <li>• Pink-footed goose <i>Anser brachyrhynchus</i>;</li> <li>• Brent Goose <i>Branta bernicla bernicla</i>; and</li> <li>• Knot <i>Calidris canutus</i>.</li> </ul>

**Table 2.13 Qualifying features of Gibraltar Point SPA (JNCC, 2008i)**

<b>Qualifying features for the Gibraltar Point SPA (JNCC, 2008i)</b>
<i>Article 4.1 Qualification (79/409/EEC)</i>
<b>During the breeding season the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Little tern <i>Sterna albifrons</i>;</li> </ul> <b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Bar-tailed Godwit <i>Limosa lapponica</i>.</li> </ul>
<i>Article 4.2 Qualification (79/409/EEC)</i>
<b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Grey plover <i>Pluvialis squatarola</i>; and</li> <li>• Knot <i>Calidris canutus</i></li> <li>• Over winter, the area regularly supports 22,137 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Oystercatcher <i>Haematopus ostralegus</i>, Knot <i>Calidris canutus</i>, Grey Plover <i>Pluvialis squatarola</i>, Bar-tailed Godwit <i>Limosa lapponica</i>.</li> </ul>

#### L2.6.5 Statutory National Designations

The Wash coastline and surrounding hinterland that form the study area also contains several sites designated under national legislation, with these being presented in **Figure 2.3** and **Table 2.15**, with the qualifying information for these sites being presented in **Table 2.16** and **2.17**.

**Table 2.15 Sites designated under national conservation legislation for the Wash study area (Sites of Special Scientific Interest)**

<b>SSSI name</b>	<b>Area (ha)</b>
Gibraltar Point	598
The Wash	62045
Dersingham Bog	159
<b>NNR name</b>	<b>Area (ha)</b>
Dersingham Bog	159
The Wash	8881



**Table 2.16 Qualifying information for sites designated under national conservation legislation for The Wash study area (SSSI)**

<b>SSSI name</b>	<b>Site Features</b>
Gibraltar Point	Gibraltar Point is a nationally important site due to its sand dunes and other coastal habitats, and associated fauna, notably invertebrates and passage and breeding birds. Gibraltar Point is also of great importance for its coastal geomorphology (Natural England, 2009a).
The Wash	The whole of the Wash is of exceptional biological interest. The intertidal mudflats and saltmarshes represent one of Britain's most important winter feeding areas for waders and wildfowl outside of the breeding season. Enormous numbers of migrant birds - of international significance - are dependent upon the rich supply of invertebrate food. The saltmarsh and shingle communities are of considerable botanical interest and the mature saltmarsh is a valuable bird breeding zone. In addition the Wash is also very important as a breeding ground for Common Seals (Natural England, 2009b).
Dersingham Bog	Dersingham Bog is the largest and most intact example of an acid valley mire in East Anglia. The site lies in the Lower Greensand zone with Sandringham Sands exposed in an old sandpit. The mire itself lies on shallow peat and has extensive areas dominated by bog mosses with several locally rare species of plant. The mire is bordered on one side by an escarpment, which marks the edge of an ancient coastline, which has large areas of heathland on its slopes. Self-regenerating pine woodland has developed on the top of the escarpment. The site also has considerable ornithological and entomological interest (Natural England, 2009c).

**Table 2.17 Qualifying information for sites designated under national conservation legislation for The Wash study area (NNR)**

<b>NNR name</b>	<b>Site Features</b>
Dersingham Bog	Dersingham NNR forms part of the Sandringham Royal Estate and is home to a wide variety of habitats including dry and wet heathland, acid valley mire and deciduous and coniferous woodland. Acid valley mire is found in the low-lying parts of the reserve where the ground is waterlogged for most of the year. Dersingham contains the largest example of this habitat in East Anglia, and many specialised plants such as bog asphodel, round-leaved sundew, cranberry and white-beaked sedge grow there.

<b>NNR name</b>	<b>Site Features</b>
The Wash	The Wash NNR is a mix of open deep water, permanent shallow water, mudflat and saltmarsh. The intertidal mudflats and saltmarshes represent one of Britain's most important winter feeding areas for waders and wildfowl. The Outer Trial Bank, an artificial island, is an important site for breeding seabirds. Common Seals pup on the sandbanks during the summer.

#### L2.6.6 Conservation features dependent upon flood risk management

Due to the nature of The Wash and its hinterland, there is little freshwater or terrestrial interest within the SEA study area. However, there are still features of conservation importance which are protected by flood risk management structures, with these sites being presented in **Table 2.18**.

**Table 2.18 Areas of conservation importance protected by flood risk management structures within the study area.**

<b>Name</b>	<b>Description of habitat protected by FRM structures</b>
Freiston Shore RSPB reserve	Freshwater lagoon and grazing marsh
Frampton Marsh LNR	Wet grassland
Frampton Marsh RSPB reserve	Wet grassland
Snettisham RSPB reserve	Coastal lagoons

#### L2.6.7 UKBAP habitats within the study area

In June 1992, the Convention of Biological Diversity was signed by 159 governments at the Earth Summit (the Rio Convention) and entered into force on 29 December 1993, being the first treaty to provide a legal framework for biodiversity conservation. The treaty called for the creation and enforcement of national strategies and action plans to conserve, protect and enhance biological diversity.

The UK Biodiversity Steering Group was created in 1994 and established the framework and criteria for identifying species (1250 in number) and habitat types of conservation concern. From this list, action plans for 391 species and 45 habitats were published – the “Biodiversity Action Plans”.

United Kingdom Biodiversity Action Plan (UKBAP) habitats within the study area (Nature on the Map, 2009) are:

- Coastal and floodplain grazing marsh;
- Coastal sand dunes;
- Coastal vegetated shingle;
- Lowland beech and yew woodland;
- Lowland calcareous grassland;
- Lowland heathland;
- Maritime cliff and slope;
- Mudflats;
- Purple moor grass and rush pasture;
- Reedbed;
- Saline lagoons;
- Undetermined grassland; and
- Wet woodland.

## **L2.7 Population & communities**

### **L2.7.1 Land Use Planning Policy**

The environmental issues in The Wash study area are central to the development of land use planning policy at the regional and local level. In regard to this, a number of planning documents are critical to identifying the environmental issues in this context:

- Boston Borough Council Local Development Framework Core Strategy (in progress, submission expected in July 2009);
- East of England Plan 2008 (East of England Regional Assembly, May 2008).
- South Holland Local Plan, July 2006;
- East Lindsey District Council Local Development Framework Core Strategy, November 2007;
- Kings Lynn and West Norfolk Borough Council Local Development Framework; and
- Kings Lynn and West Norfolk Borough Council Core Strategy Submission (in progress).

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

The main issues for land use plans in The Wash study area are provision of adequate agricultural land, flood risk, sustainable development, designated sites (for nature conservation) and impacts upon the AONB. A further key issue for land use plans in the context of a SMP relates to their compatibility with the Habitats Regulations, especially where land is allocated for housing, employment or other uses which may prejudice SMP policies. For example,

housing allocations in areas currently prevented from flooding by flood defence structures or practices would make it more difficult to undertake managed retreat or abandon existing defences. Managed realignment or no active intervention options may be preferred, or necessary in response to coastal squeeze, which may be adversely affecting international sites.

#### L2.7.2 Catchment Flood Management Plans (CFMPs)

The Catchment Flood Management Plans for this area provide a strategic approach to the management of flood risk in fluvial areas adjacent to the coast. The relevant CFMPs are:

- River Witham;
- River Welland;
- River Nene; and
- River Great Ouse.

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

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

**Economy:** To minimise economic harm through flooding.

**Environment:** To protect and enhance habitats and species.

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

*Biodiversity:* The need to maintain or enhance biodiversity.

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

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

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

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

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

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

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

#### L2.7.3 Blue Flag and Designated Bathing Beaches 2008

The Bathing Water Directive sets mandatory and guideline standards for bathing water quality at designated bathing beaches. Quality is assessed on the level of indicator bacteria in the bathing water. Guideline standards are 20 times stricter than the mandatory standard. Meeting this high standard is one of the main criteria for the award of the European Blue Flag. Designated bathing beaches within The Wash SMP study area are Heacham and Hunstanton, although there are no blue flag beaches within the study area.

#### L2.7.4 Coastal communities

The towns of Skegness, Boston, Spalding, Holbeach, King's Lynn and Hunstanton are the main centres of population, with The Wash hinterland being socio-economically diverse. In general, the area is sparsely populated by rural communities, with the market towns of Spalding, Holbeach, Wainfleet and Wisbech helping to serve these rural areas as centres for local employment and services (WESG, 2004). The large historic port towns of King's Lynn and Boston are of particular significance to the area. Commercial shipping uses the Wash as anchorage for access to ports on the rivers Witham, Welland, Nene and Great Ouse (King's Lynn and Boston each handle approximately £1m worth of cargo per annum). Broadly, the more affluent areas of The Wash hinterland are located along the south Lincolnshire coastline and west Norfolk coast in the eastern section of The Wash, with the small town of Hunstanton functioning as a vibrant, traditional seaside resort. The Wash and its hinterland are located within the counties of Lincolnshire and Norfolk, while district governance is the responsibility of four authorities – East Lindsey District Council, Boston Borough Council, South Holland District Council and the Borough Council of King's Lynn and West Norfolk. The communities within the 1 in 1000 flood zone are listed in **Table 2.19**.

**Table 2.19 Coastal communities in The Wash study area and within the 1 in 1000 flood zone (population statistics from UKSA, 2008). Note that the populations displayed are those for the community, not those at risk from flooding.**

Coastal community	District/Borough Council	Population counts (2001 census)
Friskney	East Lindsey	1,453
Fold Hill	Boston Borough	<i>No information available</i>
Wrangle and Old Leake	Boston Borough	3,068
Wrangle Lowgate	Boston Borough	<i>No information available</i>
Leake Hurn's End	Boston Borough	<i>No information available</i>
Leverton	Boston Borough	668
Bennington	Boston Borough	569
Butterwick	Boston Borough	<i>No information available</i>
Freiston	Boston Borough	1,211
Fishtoft	Boston Borough	5,444
Freiston Shore	Boston Borough	<i>No information available</i>
Scrane End	Boston Borough	<i>No information available</i>
Boston	Boston Borough	55,750
Frampton	Boston Borough	1, 217
Wyberton	Boston Borough	3,790
Kirton	Boston Borough	<i>No information available</i>
Sutterton	Boston Borough	1,124
Wigtoft	Boston Borough	<i>No information available</i>
Fosdyke	Boston Borough	486
Holbeach Hurn	South Holland	2,131
Moulton Seas End	South Holland	<i>No information available</i>
Holbeach	South Holland	6,457
Fleet Hargate	South Holland	<i>No information available</i>
Gedney	South Holland	2,305
Lutton	South Holland	<i>No information available</i>
Long Sutton	South Holland	6,461
Sutton Bridge	South Holland	3,936
Moulton	South Holland	3,073
Walpole Cross Keys	Kings Lynn and West Norfolk	469
Terrington St Clement	Kings Lynn and West Norfolk	3,902
Clenchwarton	Kings Lynn and West Norfolk	2,200
West Lynn	Kings Lynn and West Norfolk	4,136
Kings Lynn (incl. South and North Woolton)	Kings Lynn and West Norfolk	34,564
Castle Rising	Kings Lynn and West Norfolk	225

Coastal community	District/Borough Council	Population counts (2001 census)
Dersingham (incl. Wolferton)	Kings Lynn and West Norfolk	4,502
Ingoldisthorpe	Kings Lynn and West Norfolk	4,502
Snettisham	Kings Lynn and West Norfolk	3,847
Hunstanton	Kings Lynn and West Norfolk	5,685
Heacham	Kings Lynn and West Norfolk	4,609
Old Hunstanton	Kings Lynn and West Norfolk	47

#### L2.7.5 Wealth & deprivation

The 2001 census records the population of Lincolnshire as being 646,645, while the population of Norfolk was estimated at 840,700 in 2007 (Office of National Statistics, 2009). Overall, Lincolnshire is ranked 98 out of 149 (1 indicating the most deprived) County Councils in terms of deprivation (2007 figures), while Norfolk is ranked between fourth and tenth most deprived of the 34 non-metropolitan counties in England. Five wards in the study zone fall within the top 20% of most deprived areas nationally, with four of these being in Boston, with the fifth ward being Wainfleet and Friskney.

**Table 2.20** shows the relative positions on the national Indices of Multiple Deprivation for each district in The Wash study area. The following weightings were considered in the 2004 calculations – income (22.5%), employment (22.5%), health deprivation and disability (13.5%), education, skills and training (13.5%), barriers to housing and services (9.3%) and living environment (9.3%) (WESG, 2004). The districts ranking highest and lowest in England are provided for comparison.

**Table 2.20 Multiple Deprivation index for the Wash area**

Districts within The Wash area	Score	Ranked (England)
Boston	21.86	111
East Lindsey	24.62	89
King's Lynn and West Norfolk	19.09	150
South Holland	15.27	210
Highest and lowest scoring districts in England - for comparison		
Hart (Hampshire)	4.17	354
Liverpool (Merseyside)	49.78	1

Overall the study area can be characterised as being slightly above average in terms of deprivation, but with pockets of more acute deprivation of either a rural or urban nature. There is nothing apparent to suggest that deprivation has any meaningful correlation to spatial patterns in the study area, i.e. deprived communities being located in areas at risk from flooding or erosion etc.

#### L2.7.6 Key tourism features

The area as a whole does not benefit from the amount of tourism attracted to either areas on the Lincolnshire coast to the north or the North Norfolk Coast to the south. The study area's appeal to coastal tourists is limited by its typically low energy frontage and mudflat/saltmarsh coast, as opposed to beach frontages. The area is however a popular destination for bird watchers, but at the time of writing the degree to which this generated visits or overnight stays (tourism) in the area has not been established. The study area does however include the frontage in the south round to Hunstanton, which is an established tourist resort. Key tourism features within the study area are listed in **Table 2.21**.

**Table 2.21 Key tourism features of The Wash study area**

Location	Attraction
Hunstanton	Hunstanton is the only coastal resort in the East of England where the sun can be seen to set over the sea. It is a popular summer seaside destination and is close to Sandringham and the RSPB reserves at Titchwell and Snettisham.
Kings Lynn	Kings Lynn is an important tourist destination and centre for local business and commerce. The town is a centre for the seafood and fishing industry and supports a large rural population.

In addition to this, the Wash contains several caravan sites, which support tourism in the plan area for coastal recreation and bird watching. The sites in question are described in **Table 2.22**.

The ongoing viability of tourism in this area is also dependent on a range of smaller facilities which cater to the needs of tourists and actively enable visitors to interact with the local area and its attractions. Examples include the RSPB reserve at Snettisham which includes a car park and numerous bird hides and the Peter Scott Walk – a footpath which enables access along the coast and to other tracks which link the foreshore with the coastal hinterland. These facilities coupled with the range of coastal shops (such as at Freiston) collectively provide the features on which tourism depends.

**Table 2.22 Caravan Sites within The Wash SMP SEA study area**

<b>Caravan Park</b>	<b>Location</b>
White Cat Caravan & Camping Park	Leverton
Walnut Lake Holiday Park	Algarkirk
Whaplode Manor Caravan Park	Holbeach
Delph Bank Touring Caravan and Camping Park	Fleet Hargate
Silverhill Caravan Park	Lutton
Snettisham Caravan Park	Snettisham
Riverside Caravan Park	Heacham
Tall Trees Caravan Park	Heacham
Putting Green Caravan Park	Heacham
Heacham Beach Holiday Park	Heacham
Meadows Caravan Park	Heacham
Manor Park Holiday Village	Hunstanton
4 Shores Development	Hunstanton
Searles Self Catering Holiday Park	Hunstanton

#### L2.7.7 Critical Infrastructure

Critical infrastructure within the Wash SMP SEA study area is presented in **Table 2.22**. The study area is bounded by a number of A-roads that provide loosely follow the coastline and provide critical transportation links between settlements in the area and larger urban centres further inland.

Settlements off the A-roads are served by a network of B class roads, with much of the remaining road network being single-tracked and unclassified.

**Table 2.22 Critical infrastructure within The Wash SMP SEA study area**

<b>Critical Infrastructure</b>	<b>Description</b>
A149	Within the study area, the A149 runs from Hunstanton to King's Lynn, passing via the coastal communities of Snettisham and Dersingham.
A17	The A17 runs from Kings Lynn and loosely follows the coast of the south-west part of the Wash, continuing on to Sleaford and linking settlements including Holbeach, Long Sutton and Sutton Bridge.

<b>Critical Infrastructure</b>	<b>Description</b>
A16	The A16 runs from Stamford to Boston before continuing inland towards north Lincolnshire.
A52	The A52 links Boston to Skegness and follows the coast of the Wash relatively closely, linking small settlements including Wainfleet.
A47	A major arterial route for East Anglia that links Great Yarmouth, Norwich, Swaffham, Kings Lynn, Wisbech and Peterborough.
Rail link from Kings Lynn to Cambridge	Kings Lynn is the final stop on the Fen Line that stops at a number of settlements including Watlington, Downham Market, Littleport, Waterbeach and Ely.
Port of Boston	The Port of Boston is the largest port within The Wash and is capable of handling vessels up to 120m LOA and a maximum beam of 13.6m. The port offers 650m of quay frontage, 18,000m <sup>2</sup> of covered warehouse storage, 8,000 tonnes of grain silos and a secure container park. The Port of Boston handles in the region of 450 to 500 vessels per annum. Annual tonnage through the port is approximately 850,000 – 900,000 tonnes.
Port of King's Lynn	King's Lynn primarily handles agribulks, forest products, steel and break-bulk cargoes, utilising a range of specialised berths and facilities. The port has benefited from investment by ABP in recent years, seeing the creation of a high-capacity, dock-side silo complex that facilitates efficient processing of grain.
Boston to Skegness railway	Limited railway line between Boston and Skegness
Sutton Bridge Port	Port Sutton Bridge is a modern 62 acre dry cargo port and warehouse complex on the UK East coast, and has the capability to handle almost any dry cargo, with a particular focus on steel, timber bulk

Critical Infrastructure	Description
	commodity and agricultural products.
Sutton Bridge power station	790MW Gas fired power station that supplies two per cent of the electricity for England and Wales.
Gedney Marsh Wind Farm	12MW installation consisting of 6 x 2MW Repower MM82 turbines.

There are also two Royal Air Force (RAF) weapons ranges located on The Wash, at Wainfleet and Holbeach, both of which are of national military significance (WESG, 2004).

## L2.8 Soil and agricultural land quality

The soils within the SMP SEA study area are primarily well draining loamy-sands. The western part of the study area tends to feature shallow loamy and sandy soils which become more clayey moving eastwards, while mid-catchment, the loamy soils have less permeable sub-soils and are prone to seasonal waterlogging.

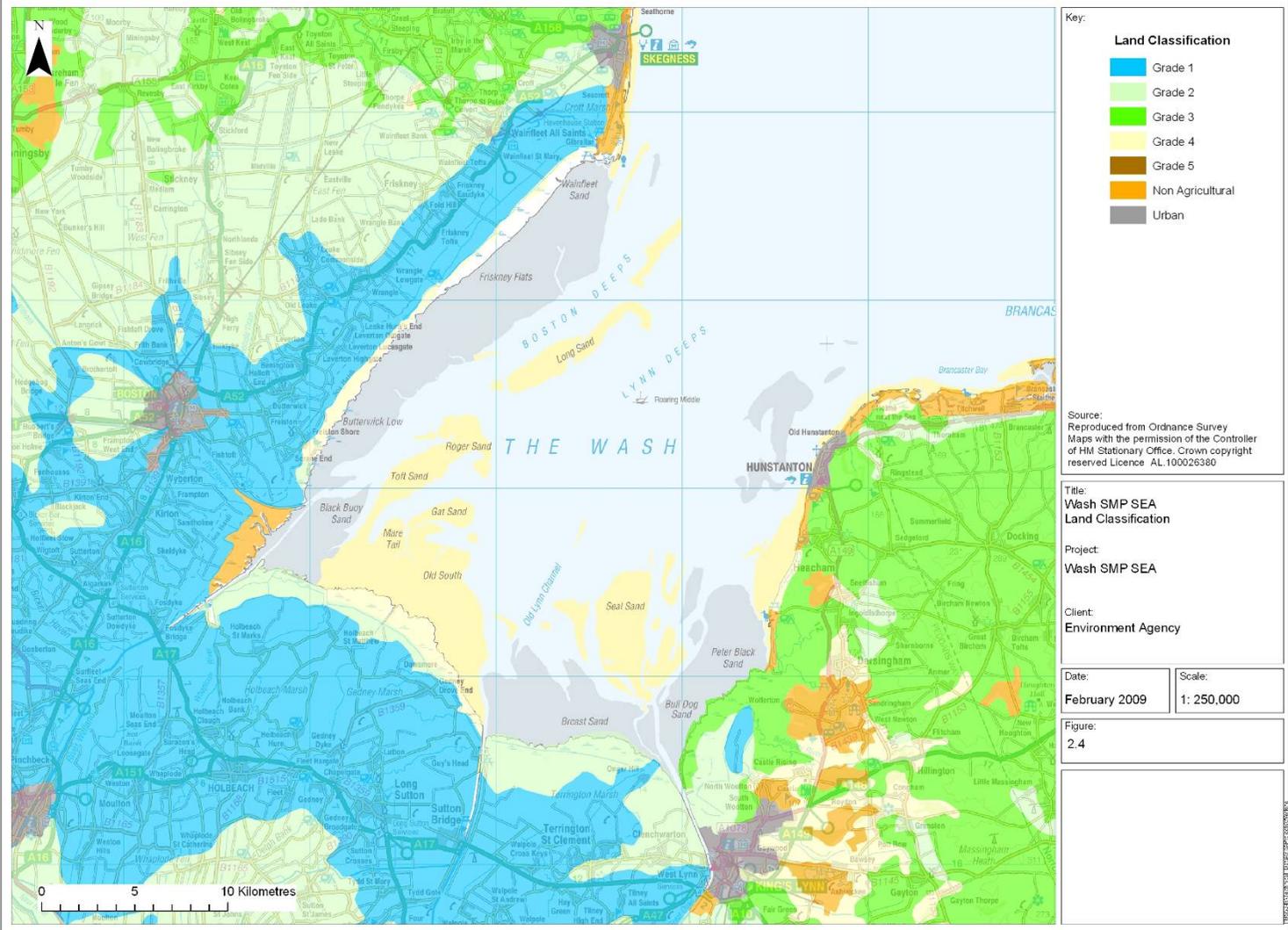
The land within the SMP SEA study area is heavily used for agriculture, with Lincolnshire being more dependent on agriculture than any other county in the UK. It is estimated that the production of food in the county is worth in the region of £250 million (WESG, 2004). The farmland on the landward side of The Wash sea banks is some of the most productive anywhere, with the highest concentration of Grade 1 agricultural land in the country (WESG, 2004). Between Gibraltar Point and the River Nene, the land is predominantly Grade 1, dropping to Grade 2 on the Norfolk side of The Wash.

A substantial amount of Grade 1 and Grade 2 land is at risk from flooding, within the area covered by this SMP. There are a total of 354,644 hectares of Grade 1 and 1,849,258 hectares of Grade 2 agricultural land in England, with the area within the scope of this SMP being presented in **Table 2.23** and **Figure 2.4**.

**Table 2.23 Quantification of land classification within the 1 in 1000 year flood zone for The Wash SMP SEA study area**

Land Grade	Area in hectares	Percentage of England's total
Grade 1	31,717	8.9%
Grade 2	6,550	0.34%

Figure 2.4 Wash SMP SEA land classification



### L3 ENVIRONMENTAL ISSUES AND ASSESSMENT CRITERIA

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

#### L3.1 Environmental Issues

From a consideration of the policy, legislation and designations relevant to The Wash 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 has been developed to avoid a reliance on generic coastal management issues (although some issues are the same around the coast and are therefore included) and has provided an account of what other plans, management obligations and stakeholders consider to be the most critical environmental issues on The Wash coast.

**The suite of issues provided is as follows:**

- 1) **Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land;**
- 2) **Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise;**
- 3) **The loss of designated intertidal habitat located seaward of existing defences due to sea level rise;**
- 4) **Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types; and**
- 5) **Maintenance of environmental conditions to support biodiversity and the quality of life; and**
- 6) **Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash.**

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

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

RECEPTOR		SHORELINE MANAGEMENT PLAN (SMP)				STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)			
SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	PDZ2 (Wolferton Creek to South Hunstanton)	PDZ3 (Hunstanton Town)	PDZ4 (Hunstanton Cliffs)	Combined SMP Objectives	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator
<b>Threats from tidal inundation to approximately ten percent of the nation's high quality agricultural land</b>									
Soil	<b>Agriculture</b>	Protect as much grade 1 and grade 2 land as possible.				Protect as much grade 1 and grade 2 land as possible.	Soil and agricultural land quality	Will SMP policy result in a change in extent of grade 1 and 2 agricultural land?	Amount of Grade 1 and Grade 2 agricultural land available.
Soil	<b>Agriculture</b>	Ensure that the impact on the UK's area of grade 1 and grade 2 land is acceptable: ensure that there is at least X area in Epoch 1 / 2 / 3				Ensure that the impact on the UK's area of grade 1 and grade 2 land is acceptable: ensure that there is at least X area in Epoch 1 / 2 / 3	Soil and agricultural land quality	Will SMP policy result in a change in extent of grade 1 and 2 agricultural land?	Amount of Grade 1 and Grade 2 agricultural land available.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>									
Water	<b>Infrastructure</b>	Avoid interruption of the drainage function of Rivers Witham, Welland, Nene and Great Ouse throughout the plan period				Avoid interruption of the drainage function of Rivers Witham, Welland, Nene and Great Ouse throughout the plan period	Hydrology and water resources	Will the SMP policy result in a change to the drainage function of discharging rivers?	Number of rivers with impacted drainage function
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>									
Population, human health	<b>Communities</b>	Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements[1], and the area landward from these settlements	Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements[1], and the area landward from these settlements			Protect as a minimum, throughout the plan period, to an appropriate standard of protection, all established settlements[1], and the area landward from these settlements	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of established settlements impacted
Population, human health	<b>Communities</b>	Protect as many settlements as possible.	Protect as many settlements as possible.			Protect as many settlements as possible.	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to	Number of properties within the tidal flood zone compared

RECEPTOR		SHORELINE MANAGEMENT PLAN (SMP)				STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)			
SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	PDZ2 (Wolferton Creek to South Hunstanton)	PDZ3 (Hunstanton Town)	PDZ4 (Hunstanton Cliffs)	Combined SMP Objectives	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator
								coastal communities?	to the current number.
Material assets	<b>Communities</b>			To maintain Hunstanton as a viable town, seaside resort and regional commercial centre throughout the plan period	To maintain Hunstanton as a viable town, seaside resort and regional commercial centre throughout the plan period	To maintain Hunstanton as a viable town, seaside resort and regional commercial centre throughout the plan period	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number.
Material assets	<b>Communities</b>				To protect as much of the existing development from cliff erosion as possible	To protect as much of the existing development from cliff erosion as possible	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	Number of properties within the tidal flood zone compared to the current number.
	<b>Timing</b>	Provide sufficient time, if required, for community adaptation	Provide sufficient time, if required, for community adaptation			Provide sufficient time, if required, for community adaptation	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	
	<b>Timing</b>	Provide sufficient time, if required, for change of flood risk management practices	Provide sufficient time, if required, for change of flood risk management practices			Provide sufficient time, if required, for change of flood risk management practices	Coastal communities	Will the SMP policy result in a change in flood and erosion risk to coastal communities?	
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>									
Material assets	<b>Infrastructure</b>	Avoid interruption of the functioning of Boston Port and King's Lynn Port throughout the plan period (note that Sutton Bridge Port is only dealt with in the relevant Timing of Policies Objective, and				Avoid interruption of the functioning of Boston Port and King's Lynn Port throughout the plan period (note that Sutton Bridge Port is only dealt with in the relevant Timing of Policies Objective, and does not have an individual Objective)	Critical infrastructure	Will the SMP policy affect the access to operation of ports?	Number of ports impacted

RECEPTOR		SHORELINE MANAGEMENT PLAN (SMP)				STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)			
SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	PDZ2 (Wolferton Creek to South Hunstanton)	PDZ3 (Hunstanton Town)	PDZ4 (Hunstanton Cliffs)	Combined SMP Objectives	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator
		does not have an individual Objective)							
Material assets	<b>Timing</b>	Provide sufficient time, if required, for adaptation of Sutton Bridge Port				Provide sufficient time, if required, for adaptation of Sutton Bridge Port	Critical infrastructure	Will the SMP policy affect the access to operation of ports?	Number of ports impacted
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>									
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>ROADS (where present)</b>				Avoid interruption of transport connections and utility supply throughout the plan period – <b>ROADS (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>ELECTRICITY PYLONS (where present)</b>				Avoid interruption of transport connections and utility supply throughout the plan period – <b>ELECTRICITY PYLONS (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>SEWAGE TREATMENT WORKS (where present)</b>				Avoid interruption of transport connections and utility supply throughout the plan period – <b>SEWAGE TREATMENT WORKS (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>PRISON (where present)</b>				Avoid interruption of transport connections and utility supply throughout the plan period – <b>PRISON (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.

RECEPTOR		SHORELINE MANAGEMENT PLAN (SMP)				STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)			
SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	PDZ2 (Wolferton Creek to South Hunstanton)	PDZ3 (Hunstanton Town)	PDZ4 (Hunstanton Cliffs)	Combined SMP Objectives	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator
Material assets	<b>Infrastructure</b>	Avoid interruption of transport connections and utility supply throughout the plan period – <b>RAILWAY LINE (where present)</b>				Avoid interruption of transport connections and utility supply throughout the plan period – <b>RAILWAY LINE (where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.
Material assets	<b>Timing</b>	Provide sufficient time, if required, for relocation of regional infrastructure and navigational infrastructure changes, ensuring continued A-road and rail transport links between Boston and Skegness, Boston and Spalding, Boston and King's Lynn, King's Lynn and Hunstanton, and links between the communities	Provide sufficient time, if required, for relocation of regional infrastructure, ensuring continued A-road links between King's Lynn and Hunstanton and links between the communities			Provide sufficient time, if required, for relocation of regional infrastructure and navigational infrastructure changes, ensuring continued A-road and rail transport links between Boston and Skegness, Boston and Spalding, Boston and King's Lynn, King's Lynn and Hunstanton, and links between the communities	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.
Material assets	<b>Timing</b>	Provide sufficient time, if required, for relocation / adaptation of MoD use of the foreshore <b>(where applicable)</b>				Provide sufficient time, if required, for relocation / adaptation of MoD use of the foreshore <b>(where applicable)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.
Material assets	<b>Timing</b>	Provide sufficient time, if required, for relocation / adaptation of prison facilities <b>(where present)</b>				Provide sufficient time, if required, for relocation / adaptation of prison facilities <b>(where present)</b>	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.

RECEPTOR		SHORELINE MANAGEMENT PLAN (SMP)				STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)			
SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	PDZ2 (Wolferton Creek to South Hunstanton)	PDZ3 (Hunstanton Town)	PDZ4 (Hunstanton Cliffs)	Combined SMP Objectives	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator
Material assets	<b>Timing</b>	Provide sufficient time, if required, for relocation / adaptation of the sewage works ( <b>where present</b> )				Provide sufficient time, if required, for relocation / adaptation of the sewage works ( <b>where present</b> )	Critical infrastructure	Will the SMP policy result in a change in flood or erosion risk to key transport, utilities and public infrastructure?	Critical infrastructure lost.
Material assets							Economic activity	Will the SMP result in a change to identified key economic activities and locations?	Economic activities and locations impacted.
Material assets							Shell fisheries	Will the SMP policy result in a change in the extent and classification of existing shellfisheries?	Predicted impact on shellfish classification.
<b>Protection of vulnerable, low lying coastal communities and the socio-economic features and issues which support them in regard to the effects of sea level rise</b>									
Material assets	<b>Communities</b>		To balance the costs of long-term sea wall maintenance with the long-term impacts on tourism values and the long-term costs of loss or relocation of the caravan parks (Heacham)			To balance the costs of long-term sea wall maintenance with the long-term impacts on tourism values and the long-term costs of loss or relocation of the caravan parks (Heacham)	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected.
Material assets	<b>Communities</b>		To balance the costs of ongoing shingle ridge maintenance with the costs of loss or relocation of the beach huts			To balance the costs of ongoing shingle ridge maintenance with the costs of loss or relocation of the beach huts	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected.
Material assets	<b>Communities</b>		If temporary tourist facilities cease to be defended in future epochs, defences will be provided for			If temporary tourist facilities cease to be defended in future epochs, defences will be provided for an adequate period for possible relocation	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be

RECEPTOR		SHORELINE MANAGEMENT PLAN (SMP)				STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)			
SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	PDZ2 (Wolferton Creek to South Hunstanton)	PDZ3 (Hunstanton Town)	PDZ4 (Hunstanton Cliffs)	Combined SMP Objectives	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator
			an adequate period for possible relocation within the auspices of the land use planning system			within the auspices of the land use planning system			affected.
Material assets	<b>Intertidal Beach</b>				To maintain the existing level of intertidal beach area throughout the plan period	To maintain the existing level of intertidal beach area throughout the plan period	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected.
Material assets	<b>Holiday Centres and Caravan Parks</b>			To balance the long-term costs of ongoing sea wall maintenance with the long-term impacts on tourism and its value on the local economy, taking into account the long-term costs of loss or relocation of the established holiday centres and caravan parks		To balance the long-term costs of ongoing sea wall maintenance with the long-term impacts on tourism and its value on the local economy, taking into account the long-term costs of loss or relocation of the established holiday centres and caravan parks	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected.
Material assets	<b>Holiday Centres and Caravan Parks</b>			If temporary tourist facilities cease to be defended in future epochs, defences will be provided for an adequate period for possible relocation within the auspices of the land use planning system		If temporary tourist facilities cease to be defended in future epochs, defences will be provided for an adequate period for possible relocation within the auspices of the land use planning system	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected.
Material assets	<b>Timing</b>	Provide sufficient time, if required, for recreational access to the foreshore				Provide sufficient time, if required, for recreational access to the foreshore	Tourism and recreation features	Will the SMP policy result in a change to key tourism and recreation features?	Number of locations where tourism or recreation activity will be affected.

RECEPTOR		SHORELINE MANAGEMENT PLAN (SMP)					STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)		
SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	PDZ2 (Wolferton Creek to South Hunstanton)	PDZ3 (Hunstanton Town)	PDZ4 (Hunstanton Cliffs)	Combined SMP Objectives	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator
<b>The loss of designated intertidal habitat located seaward of existing defences due to sea level rise</b>									
Biodiversity, flora and fauna	<b>Habitats</b>	Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and saline/coastal lagoons ( <b>where present</b> )	Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and coastal lagoons			Maintain and if possible increase the area of mudflats, saltmarsh, sand dunes and coastal lagoons	Habitats and species	Will SMP policy result in a change to conditions of European sites or habitats? Will SMP policy result in a change to SSSI condition? Will SMP policy result in a net change in priority BAP habitat extent?	Number of European sites and habitats impacted based on Habitats Regulations assessment. Number of SSSIs impacted. Amount of priority BAP habitat impacted.
<b>Threat to biodiversity due to sea level rise and the interactions between various coastal habitat types</b>									
Biodiversity, flora and fauna	<b>Flood and Erosion Risk Management</b>		Have as little flood and erosion risk management throughout the plan period as possible	Have as little flood and erosion risk management throughout the plan period as possible	Have as little flood and erosion risk management throughout the plan period as possible	Have as little flood and erosion risk management throughout the plan period as possible	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted
Biodiversity, flora and fauna	<b>Coastal Processes</b>				To maintain natural processes relating to cliffs	To maintain natural processes relating to cliffs	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted
Biodiversity, flora and fauna	<b>Coastal Processes</b>				To prevent interruption of the role of cliff erosion in supplying sediment to the neighbouring Frontages (including Hunstanton beach)	To prevent interruption of the role of cliff erosion in supplying sediment to the neighbouring Frontages (including Hunstanton beach)	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted
Biodiversity, flora and fauna	<b>Habitats</b>	Maintain natural processes relating to mudflats, saltmarsh, sand dunes and saline/coastal lagoons ( <b>where present</b> )	Maintain natural processes relating to sand and shingle shorelines, mudflats, saltmarsh, sand dunes and coastal lagoons			Maintain natural processes relating to sand and shingle shorelines, mudflats, saltmarsh, sand dunes and coastal lagoons	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted

RECEPTOR		SHORELINE MANAGEMENT PLAN (SMP)				STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)			
SEA Receptor (based on SI 1633)	SMP Objective Category	PDZ1 (Gibraltar Point to Wolferton Creek)	PDZ2 (Wolferton Creek to South Hunstanton)	PDZ3 (Hunstanton Town)	PDZ4 (Hunstanton Cliffs)	Combined SMP Objectives	Feature Identified in the SEA Scoping Report Baseline	SEA Assessment Criteria	SEA Indicator
Biodiversity, flora and fauna	<b>Habitats</b>		Allow for natural interaction between beaches and dune systems			Allow for natural interaction between beaches and dune systems	Coastal processes	Will the SMP policy result in a change in the operation of coastal processes?	Coastal processes impacted
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>									
Water							Water	Will SMP policy result in changes to features covered by local WFD objectives?	Number of features covered by local WFD objectives impacted
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>									
Landscape	<b>Landscape</b>	To maintain the integrity of the coastal landscape				To maintain the integrity of the coastal landscape	Landscape	Will the SMP policy result in a change in the quality of the coastal landscape?	Quantitative judgement
<b>Potential threats to low lying historic and archaeological features located behind current defences, in areas adjacent to early defences and the loss of the record this provides of settlement in The Wash</b>									
Cultural heritage, including architectural and archaeological heritage	<b>Timing</b>	Provide sufficient time, if required, for research of archaeological features	Provide sufficient time, if required, for research of archaeological features			Provide sufficient time, if required, for research of archaeological features	Historic environment	Will the SMP policy result in a change to designated and non-designated historic features?	Number of designated and non-designated historic features impacted

### L3.2 Assessment criteria

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

1. Demonstrate whether the objectives of the SMP are beneficial to both the socio-economic and natural environment within The Wash SMP study area;
2. Compare the environmental effects of alternative options under consideration; and
3. Identify and recommend mitigation and enhancement.

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

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

## L4 CONSULTATION

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

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

### L4.1 Approach

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

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

- The Environment Agency
- English Heritage;
- Natural England;
- Kings Lynn and West Norfolk District Council;
- South Holland District Council;
- Boston Borough Council; and
- East Lindsey District Council.

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

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

1. Has the scoping report correctly identified the environmental issues on the coastline of The Wash? (i.e. are there additional issues which need to be addressed?)
2. Has the baseline (in combination with the Theme Review and Site 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 impacts of the SMP?
4. Is the suggested methodology considered robust and appropriate to the assessment of the environmental effect of the SMP?

Once the SMP desired policy has been selected and offered in draft form for consultation, an **environmental report** will be provided which shows a detailed assessment of the selected scenario and feasible alternatives. Consultation on the SMP process will therefore support **step 2** of the SEA consultation process, with SMP consultation being expected in July 2009.

Following approval of the SMP a post-adoption statement will be produced which will identify how public response to the **environmental report** has been taken into account. If changes are required to the draft SMP, following consultation, a revised **environmental report** will be provided for consultation which will also include details of monitoring the effect of SMP policy on the SEA objectives. This will be **step 3** of the consultation process.

#### **L4.2 Key Issues raised through consultation**

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

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

## L5 NEXT STEPS

In this section the process of providing the SEA alongside the SMP process will be described through the production of the **environmental report**.

### L5.1 Active use of the SEA within the SMP Process

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

- The Appropriate Assessment (AA) under the Habitats Directive for the SMP;
- The Sustainability Appraisal (SA); and
- Consideration of the requirements of the Water Framework Directive.

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

As a component of the environmental report, the SEA monitoring plan will provide a series of actions, based on the indicators provided, which will ensure that unexpected consequences of the plan will be identified.

### L5.2 Context and methodology

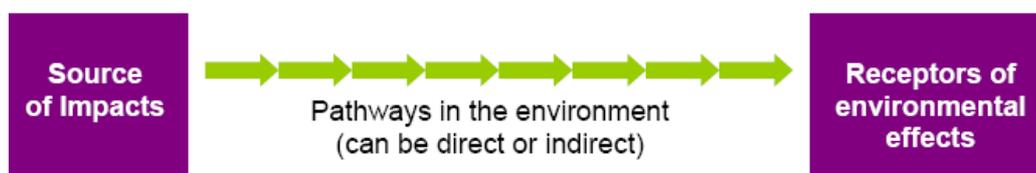
The SEA process is clearly defined in the SEA regulations and guidance suite. The basic process follows the provision of a scoping report (this document) which provides the baseline, identifies key environmental issues, outlines the methodology and offers a series of assessment criteria. Following consultation on this document and the development and assessment of SMP policy, an environmental report will be produced which details and records the actual assessment. Subsequent to this, a post-adoption statement will be provided which details the manner in which the assessment will be used to ensure that the actual affects of the SMP are accounted for through monitoring and response.

### L5.3 Prediction and Evaluation Methodology

The methodology we will use to identify and predict the likely significant environmental effects of implementing the plan is described below. To

assess the environmental effects of implementing the SMP, we will adopt an evidence based expert judgement system. This approach is based on the widely accepted Source-Pathway-Receptor model (SPR) (**Figure 5.1**).

**Figure 5.1 The Source-Pathway-Receptor model as applied to SEA**



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

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

**Table 5.1 Environmental impact significance categorisation**

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

The assessment will be recorded on a series of assessment tables (**Table 5.2**), with each SMP policy benefiting from a clear and transparent account of its likely effects on the environment and the significance of such effects.

**Table 5.2 Method of impact derivation for environmental effect and likely significance**

Rationale/Background	Predicted Outcomes	Likely Effect	Assessment/ Recommendation
		Specify effects: <ul style="list-style-type: none"> <li>• Permanence;</li> <li>• Magnitude;</li> <li>• Direction;</li> <li>• Frequency;</li> <li>• Scale;</li> <li>• Duration;</li> <li>and</li> <li>• Secondary, cumulative or synergistic impacts.</li> </ul> <p>Sensitivity (importance) of the resource.</p> <p>Probability of effect.</p>	

Data will be required to support the assessment of likely effects on a range of environmental receptors. This assessment will be based on available information and will have regard to the relatively abstract nature of SMP policy (in comparison to scheme level data). The receptors specified in the SEA practical guidance (ODPM, 2005) include:

- Air;
- Water;
- Soil;
- Landscape;
- Historic environment;
- Habitats;
- Species; and
- Population and communities (including human health, material assets, critical infrastructure etc).

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

#### **L5.4 Mitigation and monitoring**

Where potential adverse effects on the environment are identified at the assessment stage, clear measures for mitigation will be specified. Such measures will be included in the final SMP.

The final environmental report will provide a clear account of mitigation measures required and monitoring to support the on-going consideration of SMP policies as they are implemented. The combined use of mitigation and monitoring will ensure that anticipated environmental effects are prevented and unexpected effects accounted for.

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**SUB-ANNEX I**  
**Plans and pertinent policy**

Source	Objective
<p><b>East Midlands Regional Spatial Strategy (RSS): Objectives of the sub-regional strategy</b></p>	<p>The current Regional Spatial Strategy for the East Midlands (RSS8) was published in March 2005. It provides a broad development strategy for the East Midlands up to 2021. A consultation on the published plan was undertaken in autumn 2008 with the final version of the plan due for release in the early part of 2009.</p> <p>The aim of the RSS is to ensure that development contributes to an improved environment, by requiring high standards of design and sustainable construction, protecting and enhancing environmental assets (including landscape and biodiversity) and providing green space and related infrastructure (green infrastructure).</p> <p><b>Policy 6 – Regional priorities for development in rural areas</b></p> <p>Development plans Development Plans, Local Development Frameworks, Local Transport Plans and economic development strategies should ensure that new development maintains the distinctive character and vitality of rural communities, strengthens rural enterprise and linkages between settlements and their hinterlands, helps to shorten journeys and facilitates access to jobs and services by:</p> <ul style="list-style-type: none"> <li>• encouraging the provision of public transport and opportunities for the use of other non-car modes of travel;</li> <li>• providing for housing and a range of services in market towns to serve a wider hinterland;</li> <li>• providing for employment development to strengthen the vitality and viability of market towns;</li> <li>• identifying other settlements, or groups of settlements, which are accessible to the rural population, as the preferred location outside of market towns, for local needs housing including affordable housing and the provision and retention of most other services;</li> <li>• encouraging development opportunities related to the rural economy, including farm based enterprises and the appropriately scaled growth of new and existing rural businesses; and</li> <li>• securing improvements in transport and communications infrastructure where it can be demonstrated that poor linkages have led to disadvantage compared to the rest of the region.</li> </ul>

Source	Objective
	<p><b>Policy 7 – Development in the Eastern sub-area</b> (Includes):</p> <ul style="list-style-type: none"> <li>• The protection of landscape and natural beauty of the Lincolnshire Wolds AONB</li> <li>• The protection and enhancement of the natural and historic environment of the coastal margin including the Wash and Rutland Water.</li> </ul> <p><b>Policy 24 – Regional priorities for rural diversification</b></p> <p>Local Authorities and Sub-Regional Strategic Partnerships should work together to promote the continued diversification and further development of the rural economy, where this is consistent with a sustainable pattern of development and the environmentally sound management of the countryside. Particular consideration should be given to:</p> <ul style="list-style-type: none"> <li>• those areas that fall within the EU Objective 2 areas of north Lincolnshire and north Derbyshire; and</li> <li>• those areas that fall within Rural Action Areas identified by SSPs.</li> </ul> <p><b>Policy 27 – Protecting and enhancing the region’s natural and cultural assets</b></p> <p>Sustainable development should ensure the protection, appropriate management and enhancement of the region’s natural and cultural assets (and their settings). In the development and implementation of strategies and programmes in the region, local authorities and other bodies should apply the following principles:</p> <ul style="list-style-type: none"> <li>• the promotion of the highest level of protection for the region’s nationally and internationally designated natural and cultural assets;</li> <li>• damage to natural or cultural assets (and their settings) should be avoided wherever and as far as possible, recognising that such assets are usually irreplaceable;</li> <li>• unavoidable damage must be clearly justified by a need for development in that location which outweighs the damage that would result and should be reduced to a minimum through mitigation measures;</li> <li>• unavoidable damage which cannot be mitigated should be compensated for, preferably in a relevant local context and where possible in ways which also contribute to social and economic objectives;</li> <li>• overall there should be no net loss of natural</li> </ul>

Source	Objective
	<p>and cultural assets, and opportunities should be sought to achieve a net gain across the region; and</p> <ul style="list-style-type: none"> <li>• protection of the region's best and most versatile land.</li> </ul> <p><b>Policy 28 – Priorities for enhancing the region's biodiversity</b></p> <p>Local authorities, environmental agencies, developers and businesses should work together to promote a major step change increase in the level of the region's biodiversity. This should be done by the:</p> <ul style="list-style-type: none"> <li>• achievement of the East Midlands regional contribution towards the UK Biodiversity Action Plan targets as set out in Appendix 5;</li> <li>• establishment of large scale habitat creation projects in the priority areas of Lincolnshire, the region's Strategic River Corridors and heathland areas;</li> <li>• establishment of a regional project to promote the recreation of key wildlife habitats in each Natural Area in the East Midlands;</li> <li>• establishment of a network of semi-natural green spaces in urban areas;</li> <li>• management of features of the landscape which act as corridors and "stepping stones", essential for the migration and dispersal of wildlife; and</li> <li>• development and implementation of mechanisms to ensure that development results in no net loss of BAP habitats and species and that net gain is achieved.</li> </ul> <p><b>Policy 30 - Priorities for the Management and Enhancement of the Region's Landscape</b></p> <p>Development Plans, future Local Development Frameworks, and other strategies of local authorities and agencies should:</p> <ul style="list-style-type: none"> <li>• continue to promote the highest level of landscape character protection for the region's nationally designated landscapes of the Peak District National Park and the Lincolnshire Wolds Area of Outstanding Natural Beauty;</li> <li>• promote initiatives to protect and enhance the natural and heritage landscape assets, in particular the Sherwood, Charnwood and Rockingham Forests; and</li> <li>• be informed by landscape character assessments to underpin and act as key components of criteria-based policies for the</li> </ul>

Source	Objective
	<p>consideration of development proposals in rural or urban fringe areas. Where not already in place, local authorities should work towards preparing comprehensive assessments of the character of their landscapes to coincide with the review of their local development documents. This should assess whether there are exceptional local circumstances that would require the retention of any local landscape designations and associated policies in local development frameworks.</p> <p><b>Policy 31- Regional Priorities for the Historic Environment</b>  Development Plans, future Local Development Frameworks, and other strategies should seek to understand, conserve and enhance the historic environment of the East Midlands, in recognition of its own intrinsic value, and its contribution to the region's quality of life.</p> <p>Across the region and particularly in areas where growth or regeneration is a priority, Development Plans, Local Development Frameworks and economic development strategies should pay particular attention to promoting the sensitive change of the historic environment, retaining local distinctiveness, by:</p> <ul style="list-style-type: none"> <li>• identifying and assessing the significance of specific historic and cultural assets (including their settings);</li> <li>• using characterisation to understand their contribution to the landscape or townscape in areas of change;</li> <li>• encouraging the refurbishment and re-use of disused or under-used buildings of some historic or architectural merit and incorporating them sensitively into the regeneration scheme;</li> <li>• promoting the use of local building materials; and</li> <li>• recognising the opportunities for enhancing existing tourism attractions and for developing the potential of other areas and sites of historic interest.</li> </ul> <p><b>Policy 33 - A Regional Approach to the Water Environment</b>  Development Plans, future Local Development Frameworks, and policies of the Environment Agency and other agencies should be co-coordinated to:</p> <ul style="list-style-type: none"> <li>• take water related issues into account at an early stage in the process of identifying land for</li> </ul>

Source	Objective
	<p>development;</p> <ul style="list-style-type: none"> <li>• protect and improve water quality and reduce the risk of pollution especially to vulnerable groundwater;</li> <li>• manage supply and demand, require sustainable drainage where practicable and promote the efficient use of water;</li> <li>• reduce unsustainable abstraction from watercourses and aquifers to sustainable levels;</li> <li>• locate and phase development to take account of constraints on water resources; and</li> <li>• plan rural areas to include winter storage reservoirs and lessen the impact of abstraction from rivers.</li> </ul> <p><b>Policy 34 - Regional Priorities for Strategic River Corridors</b>  Development Plans, future Local Development Frameworks, and other strategies of local authorities and other agencies should seek to protect and enhance the natural and cultural environment of the region's strategic river corridors of the Nene, Trent, Soar, Welland, Witham, Derwent and Dove, along with their tributaries, and rivers which contribute to river corridors of a strategic nature in adjoining regions.</p> <p>Actions of agencies and other bodies including those of adjoining regions should be co-coordinated to maintain and enhance the multi-functional importance of strategic river corridors for wildlife, landscape and townscape, regeneration and economic diversification, education, recreation, the historic environment, including archaeology, and managing flood risk.</p> <p><b>Policy 35 - Priorities for the Management of the Lincolnshire Coast</b>  Local authorities and other agencies should identify arrangements for effective co-operation to manage the Lincolnshire Coast. They should promote the development of coastal zone management plans to help achieve an integrated approach to coastal management, including North East Lincolnshire in the adjacent region.</p> <p>Development Plans should ensure that any development along the Lincolnshire Coast requires a coastal location and that opportunities are taken to locate new development primarily in the existing urban areas.</p>

Source	Objective
	<p><b>Policy 36 - A Regional Approach to Managing Flood Risk</b>  Development Plans, future Local Development Frameworks, and strategies of relevant agencies should:</p> <ul style="list-style-type: none"> <li>• be informed by the use of appropriate Strategic Flood Risk Assessments in order to evaluate actual flood risk and should include policies which prevent inappropriate development either in, or where there would be an adverse impact on, the coastal and fluvial floodplain areas;</li> <li>• deliver a programme of flood management schemes that also maximise biodiversity and other regeneration benefits; and</li> <li>• require sustainable drainage in all new developments where practicable.</li> </ul> <p>Development should not be permitted if, alone or in conjunction with other new development, it would:</p> <ul style="list-style-type: none"> <li>• be at unacceptable risk from flooding or create such an unacceptable risk elsewhere;</li> <li>• inhibit the capacity of the floodplain to store water;</li> <li>• impede the flow of floodwater;</li> <li>• have a detrimental impact upon ground water storage capacity;</li> <li>• otherwise unacceptably increase flood risk; and</li> <li>• interfere with coastal processes.</li> </ul> <p>However, such development may be acceptable on the basis of conditions or agreements for adequate measures to mitigate the effects on the overall flooding regime, including provision for the maintenance and enhancement (where appropriate) of biodiversity. Any such measures must accord with the flood management regime for that location.</p> <p>Strategic flood risk assessments should be carried out where appropriate to inform the implementation of this policy.</p> <p><b>Policy 43 - Sub-area objectives for the eastern sub-area</b></p> <ul style="list-style-type: none"> <li>• <b>E3.</b> Making better use of the opportunities offered by existing ports, in particular Boston, for all freight movements, and improving linkages to major ports in adjacent regions such as Grimsby, Immingham and Felixstowe.</li> <li>• <b>E4.</b> Improving access by all modes to the Lincolnshire coast.</li> </ul>

Source	Objective
<p><b>East of England Regional Spatial Strategy (RSS): Objectives of the sub-regional strategy</b></p>	<p>In the northern part of the region:</p> <ul style="list-style-type: none"> <li>• major change in the Cambridge sub-region, to achieve a more sustainable balance between job growth and housing development</li> <li>• a matching focus on other key regional centres (Norwich, Peterborough and Ipswich) and other regionally significant towns (Bury St Edmunds and King's Lynn) to provide economic and urban development</li> <li>• priority for the economic regeneration of Great Yarmouth and Lowestoft, for localised pockets of deprivation in all the above centres and the rural areas and market towns.</li> </ul> <p>In the southern part of the region:</p> <ul style="list-style-type: none"> <li>• consideration of major growth pressures and potential in the Stansted/M11 area, and around Milton Keynes (immediately outside but affecting the region)</li> <li>• national and regional priority for regeneration of the Thames Gateway (RPG9 extended this in south Essex up to Southend-on-Sea) and the definition of additional 'priority areas for economic regeneration' at Luton/Dunstable, Harlow and the Lee Valley, and the Harwich/Clacton area.</li> </ul> <p><b>Policy SS1: achieving sustainable development</b></p> <ul style="list-style-type: none"> <li>• The spatial strategy aims to achieve a sustainable relationship between jobs, homes and services at the strategic and local level. It requires a sequential approach to the location of major development as a core component of sustainable development. Conserving the region's environment, quality of life, local character and natural resources, whilst adapting to climate change, together with tackling the problems of social inclusion and deprivation are also key strands in achieving sustainable development; and</li> <li>• Local development documents will first consider the reuse of land and buildings within urban areas, then extensions to those areas, and finally other locations where there is good accessibility to public transport, or where proposed development can contribute to improving public transport access.</li> </ul> <p><b>Policy SS2: overall approach to the spatial strategy</b></p> <ul style="list-style-type: none"> <li>• In order to achieve a close correlation between homes, jobs and community facilities, urban areas will be the main focus for development and redevelopment in the region;</li> <li>• A sequential approach to the location of new</li> </ul>

Source	Objective
	<p>development will be adopted to deliver the quality of life improvements set out in the vision; and</p> <ul style="list-style-type: none"> <li>• Local development documents will ensure a balanced and deliverable supply of land for employment, housing, and supporting services, by encouraging the change of use of land where alternative development would represent a more sustainable land-use and allow for proposals that would make more efficient use of vacant and underused land and property</li> </ul> <p><b>Policy SS3: development in and adjoining urban area</b></p> <ul style="list-style-type: none"> <li>• Greenfield land releases should be appropriate in scale to the adjoining urban area. Significant urban extensions should be large enough to provide a sustainable form of development, in relation to employment, public transport provision, and social, health, education, and community facilities provision.</li> </ul> <p><b>Policy SS4: use of previously developed land and buildings</b></p> <ul style="list-style-type: none"> <li>• At least 60% of all new development in the region will take place in or using previously used land or buildings. Local development documents will identify and allocate suitable previously developed land and buildings for new development with a view to contributing to this target.</li> </ul> <p><b>Policy SS6: transport strategy</b></p> <ul style="list-style-type: none"> <li>• Transport delivery agencies will improve accessibility and support the economic and spatial development of the region;</li> <li>• Improving accessibility to jobs, services and leisure/tourist activities;</li> <li>• Reducing the need to travel, while addressing the problems of congestion, economic regeneration and further housing growth as well as strategic movement to neighbouring regions, ports and airports; and</li> <li>• Minimising environmental damage and improving safety and security</li> </ul> <p><b>Policy SS7: green belt</b></p> <ul style="list-style-type: none"> <li>• The broad extent of green belts in the East of England is considered to be appropriate, and will be maintained;</li> <li>• Some urban area green belts need reviewing as part of an appraisal to identify the most sustainable locations for new development; and</li> <li>• In order to maintain the broad extent of green belts in the region, reviews will consider if compensating additions to the green belts are needed.</li> </ul>

Source	Objective
	<p><b>Policy SS9: development in rural areas</b>            In order to sustain the viability and secure revitalisation of the region's market towns, local authorities will consider the need to:</p> <ul style="list-style-type: none"> <li>• Accommodate additional housing, employment growth and economic diversification;</li> <li>• Enhance the environment of the town centre;</li> <li>• Improve the accessibility of the town by public transport from surrounding rural areas;</li> <li>• Extend provision for shopping facilities and services in the town centre; and</li> <li>• Improve access to high-speed communications technology to assist economic diversification.</li> </ul> <p><b>Policy SS10: the regional economy</b></p> <ul style="list-style-type: none"> <li>• The regional economy will be supported and developed to ensure that it contributes fully to national, regional and local prosperity in order to improve quality of life for those who live and work in the Region. Opportunities provided by the relationship with the European economy, the London economy and other neighbouring economies will be exploited and will follow the principles of sustainable development.</li> </ul> <p><b>Policy SS14: development and flood risk</b></p> <ul style="list-style-type: none"> <li>• Coastal and river flood risk is a significant factor in the East of the England. The priority is to defend existing properties from flooding, and where possible locate new development in locations with little or no risk of flooding; and</li> <li>• Promote the use of strategic flood risk assessments to guide development away from floodplains, areas at risk or likely to be at risk in future from flooding, or where development would increase the risk of flooding elsewhere</li> </ul>
<p><b>The Wash Estuary Management Plan</b></p>	<p><b>Flood defence and coast protection zones</b></p> <ul style="list-style-type: none"> <li>• To maintain adequate standards of flood defence to protect people and property;</li> <li>• To consider appropriate alternatives to the further taking of saltmarsh habitat for engineering works or other purposes;</li> <li>• To examine the suitability of set-back or foreshore recharge schemes in order to balance the increasing loss of inter-tidal habitats in south-eastern England;</li> </ul>

Source	Objective
	<p><i>Within these goals the SMP will have the following objectives:</i></p> <p><b>Flood defence objectives:</b></p> <ul style="list-style-type: none"> <li>• Objective FDCP1: To develop a sustainable policy which gives due consideration to the environment and potential risk of flooding and erosion.</li> <li>• Objective FDCP2: To assign standards for the Wash having due regard to land usage, tidal processes, socio-environmental impact, and impact of current defences.</li> <li>• Objective FDCP3: To identify potential</li> </ul> <p><b>Nature objectives:</b></p> <ul style="list-style-type: none"> <li>• Objective L1.1. To ensure that the open remote marshland landscape is maintained.</li> <li>• Objective L1.2. To ensure the marshes are managed in harmony with the landscape to support a healthy population of waterfowl which is essential to the marshland scene.</li> <li>• Objective L2. To maintain the open landscape of the reclaimed unsettled marsh.</li> <li>• Objective L3. To conserve the existing attractive landscape pattern of the settled marsh.</li> <li>• Objective L4. To conserve the open remote character of the seaside dunes area.</li> <li>• Objective L5. To conserve the seaside features which relate to the wider Wash landscape.</li> <li>• Objective L.6. To evaluate the character and importance of the seascape.</li> </ul> <p><b>Saltmarsh objectives:</b></p> <ul style="list-style-type: none"> <li>• Objective S1. To consider alternatives to the taking or using of saltmarsh for engineering or other works, which significantly affect the resource, and in so doing to ensure that the potential impact on communities and the wider local environment is fully taken into account.</li> <li>• Objective S2. To continue to monitor the Wash in order to determine areas of accretion or erosion and the development or loss of saltmarsh communities in such areas.</li> <li>• Objective S3. To encourage the reintroduction of grazing to those saltmarsh areas which are known to have been previously grazed, with priority given to areas where conservation interest is known to be declining; to seek to ensure that grazing is up to a maximum of 50% of the total area of saltmarsh; to seek to ensure that grazing is set at a level appropriate to the</li> </ul>

Source	Objective
	<p><b>Waterfowl conservation:</b></p> <ul style="list-style-type: none"> <li>• Objective W1: To seek to ensure that existing or proposed activities or developments having or likely to have a significant impact upon the Wash and its waterfowl populations are discouraged or suitably modified.</li> <li>• Objective W2: To encourage all relevant parties, especially land managers, to consider ways in which changes in current agricultural methods might be managed to benefit waterfowl.</li> <li>• Objective W3: To seek to retain and manage all existing freshwater marsh for the benefit of waterfowl populations by maintaining appropriate grazing and water management.</li> <li>• Objective W4: To encourage all relevant parties to work together to examine the potential for creating freshwater grazing marsh, in the light of past habitat losses around the Wash.</li> <li>• Objective W5: To review current research, survey and monitoring projects in relation to the Goals and Objectives for Wash Waterfowl and their habitats, and support if necessary those projects which further these Goals and Objectives.</li> <li>• Objective W6: To seek to ensure that the necessary research, survey and monitoring of the waterfowl populations and the quality and extent of their habitats is undertaken or maintained.</li> <li>• Objective W7: To seek to ensure that a network of undisturbed nesting, feeding and roosting areas exists to meet the needs of wintering, migrating and nesting waterfowl, through consultation and co-operation with relevant parties.</li> <li>• Objective W8: To seek to establish and promote codes of good conduct for potentially disturbing activities.</li> <li>• Objective W9: To seek to provide control areas suitable for research, including comparative assessment of the effects of activities upon waterfowl elsewhere in the site.</li> <li>• Objective W10: To continue to operate sustainable wildfowling through Clubs and Associations.</li> <li>• Objective W11: To continue to promote good practice through self management.</li> <li>• Objective W12: To continue to co-ordinate wildfowling management around the Wash.</li> <li>• Objective W13: To seek to ensure that all clubs produce and review management plans.</li> <li>• Objective W14: To standardise existing programmes of monitoring.</li> </ul>

Source	Objective
<b>Kings Lynn and West Norfolk District Councils LDF</b>	<p><b>Hunstanton</b></p> <p>The Environment:</p> <ul style="list-style-type: none"> <li>• Ensure a controlled and clear approach to development in the town;</li> <li>• Reinforce and improve the Victorian heritage of Hunstanton through conservation and innovative design;</li> <li>• Retain and enhance open spaces;</li> <li>• Protect and maintain the unique natural environment;</li> <li>• Reintroduce the rail link from King's Lynn to Hunstanton;</li> <li>• Support improved access to the town by encouraging improvements to the A149, south of Hunstanton.</li> </ul> <p>Rural Areas:</p> <ul style="list-style-type: none"> <li>• Environmental Enhancement:</li> <li>• Protection of the best and most versatile agricultural land.</li> <li>• Protection and enhancement of the natural, historic and built environment;</li> <li>• Protect the diversity of wildlife and distinctive landscape character including the coast from conflicting development proposals;</li> <li>• Respect the zonal approach of the AONB Management Plan;</li> <li>• Protect the rural and coastal environment as a visitor destination and support green tourism initiatives, which can be shown to be sustainable with a low environmental impact;</li> <li>• Recognise the unique characteristics of individual villages and the needs of different rural areas.</li> </ul>
<b>Boston Borough Council's Interim plan</b>	<p><b>Strategic Aims</b></p> <ul style="list-style-type: none"> <li>• Secure the conservation of the historic character of the Borough's built and archaeological environment, and seek improvements to the natural environment;</li> <li>• Retain and enhance the rural character of the countryside while encouraging sustainable development needed to support the rural economy; and</li> <li>• Ensure that the development needs of the Borough are met without exacerbating the risk to life and property from flooding.</li> </ul> <p>Plan policies:</p> <ul style="list-style-type: none"> <li>• E14: New habitats, biodiversity and wildlife resource management – planning permission</li> </ul>

Source	Objective
	<p>will be granted for proposals to extend (or create new) wildlife habitats appropriate to the area, the protection and satisfactory management of existing sites, habitats and other features of wildlife value affected by approved planning proposals will be ensured.</p> <p><i>Justification: with the exception of the coastal margin, the Borough is an area of comparatively limited ecological and habitat diversity. Consequently, The Council supports the provisions of the Lincolnshire Biodiversity Action Plan (LBAP). In many cases, the creation of a wildlife habitat will not require planning permission, but where consent is needed, it will be forthcoming provided the proposal relates to a habitat which is appropriate to the area. The Council will also encourage the provision of new wildlife habitats to be incorporated within wider major development schemes, particularly those specified by the Lincolnshire Biodiversity Action Plan via the attachment of conditions to planning permissions or through planning obligations.</i></p> <p><i>In order to protect existing biodiversity, where this is to be affected by development proposals, landscape features important to wild flora and fauna must be effectively managed. Such features include those which, by virtue of their linear and continuous structure (watercourses and their banks, traditional field boundaries) or through their function as stepping stones (ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species. Therefore, when considering planning applications affecting such features, the Council will seek to assure their proper future management either through planning conditions or obligations. Alternatively, where it is appropriate the Council may wish to enter into management agreements with developers or land owners under Section 39 of the Wildlife and Countryside Act 1981.</i></p> <ul style="list-style-type: none"> <li>• E15: Coastal zone – planning permission will be granted for minor developments in the coastal zone related to the enjoyment of the countryside, the foreshore and for small scale agricultural developments. Small extensions to existing buildings and uses will be allowed where the character of the countryside remains unaffected.</li> </ul>

Source	Objective
	<p><i>Justification: the Borough's coastal strip comprises saltmarsh and agricultural land reclaimed from the Wash and is important for ecology, landscape, nature conservation and its historic interest. Public access is very limited and non-farming activities are restricted to informal leisure pursuits, such as walking along sea banks and bird watching. Planning applications for development are very few in number, and it is intended that development should in future continue to be restricted to proposals essential for existing pursuits in order to protect the open and undeveloped character of the locality. In particular, planning permission for development needed to support existing agricultural operations in the vicinity, or habitat creation schemes, will normally be granted. There has been a number of planning applications for onshore wind turbines in the county and there are also proposals for off shore wind turbines in the 'Greater Wash'. This is the area between the Wash and the Humber Estuary. Owing to the undeveloped character of the coastal zone and its importance for wildlife it is not considered that proposals for on shore wind farms are appropriate. Such development will be considered against policy G10. Development for off shore wind turbines will require onshore development of infrastructure such as sub stations and cable routes but these should avoid the coastal zone.</i></p>
<p><b>South District Local objectives</b></p> <p><b>Holland Council Plan</b></p>	<p><b>Objectives</b></p> <ul style="list-style-type: none"> <li>• To safeguard, enhance and extend the amenity, wildlife and landscape quality of the district;</li> <li>• To conserve and enhance the water environment and to protect inland and ground waters from pollution and derogation and to minimise the risk of flooding;</li> <li>• To protect the countryside as a natural and economic resource</li> </ul> <p><b>Priorities</b></p> <ul style="list-style-type: none"> <li>• Safeguarding and enhancing the natural environment and reversing the decline in biodiversity</li> </ul>
<p><b>East District sustainability appraisal objectives</b></p> <p><b>Lindsey Council</b></p>	<ul style="list-style-type: none"> <li>• Protect and enhance the quality and distinctiveness of the areas' biodiversity (native plants and animals) and geodiversity;</li> <li>• Protect and enhance the quality and distinctiveness of the area's landscapes, townscapes and historic environment;</li> </ul>

Source	Objective
	<ul style="list-style-type: none"> <li>• Protect natural resources from avoidable losses and pollution and minimise the impacts of unavoidable losses and pollution;</li> <li>• Avoid the risk of flooding (where possible) and fully mitigate against the impacts of flooding where it cannot be avoided;</li> <li>• Prioritise appropriate re-use of previously developed land and minimise the loss of the best agricultural land and greenfield sites;</li> <li>• Positively plan for, and minimise the effects of, climate change.</li> </ul>
<b>Water Framework Directive</b>	<p>Environmental objectives: Article 4.1:</p> <p>1(a)(i) member states shall implement the necessary measures to avoid deterioration of the status of all bodies of surface water;</p> <p>1(c) Member States shall achieve compliance with any standards and objectives at the latest 15 years after the date of entry into force of this Directive, unless otherwise specified in the Community legislation under which the individual protected areas have been established;</p> <p>the <b>main environmental objectives</b> in the Directive are manifold and include the following elements (for details see Article 4 §1, (a) surface waters, (b) groundwaters and (c) protected areas):</p> <ul style="list-style-type: none"> <li>• <b>No deterioration</b> of status for surface and groundwaters and the protection, enhancement and restoration of all water bodies;</li> <li>• Achievement of <b>good status</b> by 2015, i.e. good ecological status (or potential) and good chemical status for surface waters and good chemical and good quantitative status for groundwaters;</li> <li>• <b>Progressive reduction of pollution</b> of priority substances and <b>phase-out</b> of priority hazardous substances in surface waters and prevention and limitation of input of pollutants in groundwaters;</li> <li>• <b>Reversal</b> of any significant, upward <b>trend</b> of pollutants in groundwaters;</li> <li>• Achievement of standards and objectives set for <b>protected areas</b> in Community legislation.</li> </ul>

Source	Objective
Habitats Directive	<p>The main provisions of the Habitats Directive include:</p> <ul style="list-style-type: none"> <li>• Whereas the preservation, protection and improvement of the quality of the environment, including the conservation of natural habitats and of wild fauna and flora, are an essential objective of general interest pursued by the Community, as stated in Article 130r of the Treaty;</li> <li>• Whereas the European Community policy and action programme on the environment (1987 to 1992)(4) makes provision for measures regarding the conservation of nature and natural resources;</li> <li>• Whereas, the main aim of this Directive being to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements, this Directive makes a contribution to the general objective of sustainable development; whereas the maintenance of such biodiversity may in certain cases require the maintenance, or indeed the encouragement, of human activities;</li> <li>• Whereas, in the European territory of the Member States, natural habitats are continuing to deteriorate and an increasing number of wild species are seriously threatened; whereas given that the threatened habitats and species form part of the Community's natural heritage and the threats to them are often of a transboundary nature, it is necessary to take measures at Community level in order to conserve them;</li> <li>• Whereas, in view of the threats to certain types of natural habitat and certain species, it is necessary to define them as having priority in order to favour the early implementation of measures to conserve them;</li> <li>• Whereas, in order to ensure the restoration or maintenance of natural habitats and species of Community interest at a favourable conservation status, it is necessary to designate special areas of conservation in order to create a coherent European ecological network according to a specified timetable;</li> <li>• Whereas all the areas designated, including those classified now or in the future as special protection areas pursuant to Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds(5), will have to be incorporated into</li> </ul>

Source	Objective
	<p>the coherent European ecological network;</p> <ul style="list-style-type: none"> <li>• Whereas it is appropriate, in each area designated, to implement the necessary measures having regard to the conservation objectives pursued;</li> <li>• Whereas sites eligible for designation as special areas of conservation are proposed by the Member States but whereas a procedure must nevertheless be laid down to allow the designation in exceptional cases of a site which has not been proposed by a Member State but which the Community considers essential for either the maintenance or the survival of a priority natural habitat type or a priority species;</li> <li>• Whereas an appropriate assessment must be made of any plan or programme likely to have a significant effect on the conservation objectives of a site which has been designated or is designated in future;</li> <li>• Whereas it is recognized that the adoption of measures intended to promote the conservation of priority natural habitats and priority species of Community interest is a common responsibility of all Member States; whereas this may, however, impose an excessive financial burden on certain Member States given, on the one hand, the uneven distribution of such habitats and species throughout the Community and, on the other hand, the fact that the "polluter pays" principle can have only limited application in the special case of nature conservation;</li> <li>• Whereas it is therefore agreed that, in this exceptional case, a contribution by means of Community co-financing should be provided for within the limits of the resources made available under the Community's decisions;</li> <li>• Whereas land-use planning and development policies should encourage the management of features of the landscape which are of major importance for wild fauna and flora;</li> <li>• Whereas a system should be set up for surveillance of the conservation status of the natural habitats and species covered by this Directive;</li> <li>• Whereas a general system of protection is required for certain species of flora and fauna to complement Directive 79/409/EEC; whereas provision should be made for management measures for certain species, if their</li> </ul>

Source	Objective
	<p>conservation status so warrants, including the prohibition of certain means of capture or killing, whilst providing for the possibility of derogations on certain conditions;</p>
<p><b>Birds Directive</b></p>	<p>The main provisions of the Directive include:</p> <ul style="list-style-type: none"> <li>• The maintenance of the favourable conservation status of all wild bird species across their distributional range (Article 2) with the encouragement of various activities to that end (Article 3).</li> <li>• The identification and classification of Special Protection Areas for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4). (Together with Special Areas of Conservation (SACs) designated under the Habitats Directive, SPAs form a network of pan-European protected areas known as Natura 2000.)</li> <li>• The establishment of a general scheme of protection for all wild birds (Article 5).</li> <li>• Restrictions on the sale and keeping of wild birds (Article 6).</li> <li>• Specification of the conditions under which hunting and falconry can be undertaken (Article 7). (Huntable species are listed on Annex II.1 and Annex II.2 of the Directive).</li> <li>• Prohibition of large-scale non-selective means of bird killing (Article 8).</li> <li>• Procedures under which Member States may derogate from the provisions of Articles 5-8 (Article 9) — that is, the conditions under which permission may be given for otherwise prohibited activities.</li> <li>• Encouragement of certain forms of relevant research (Article 10).</li> <li>• Requirements to ensure that introduction of non-native birds do not threatened other biodiversity (Article 11).</li> </ul>

## **SUB-ANNEX II**

### **Pertinent legislation**

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

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix 3. To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species (JNCC, 2008j).

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

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

## **B. The Convention on Biological Diversity**

Biological diversity - or biodiversity - is the term given to the variety of life on Earth and the natural patterns it forms (JNCC, 2008k). The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes and, increasingly, by the influence of humans. It forms the web of life of which we are an integral part and upon which we so fully depend, providing a large number of goods and services that sustain our lives. Biodiversity consists of hierarchical levels, encompassing the range of landscapes and ecosystems found on the planet, the communities of organisms found within them, the variety of animal, plant and micro-organism species of which these communities consist, and the genetic differences within each species. All of these levels are linked by natural (or semi-natural or human-induced) processes, from gene-flow at the genetic level through to successional habitat change at the landscape level. It is the combination of life forms and their interactions with each other and with the rest of the

environment that has made Earth a uniquely habitable place for humans. However, biodiversity is threatened by many factors, including habitat destruction and degradation, pollution, climate change and introduced species. The loss of biodiversity affects food supplies, opportunities for tourism and recreation, sources of medicines, and energy. It also interferes with essential ecological functions.

The Convention on Biological Diversity (Biodiversity Convention or CBD) was adopted at the Earth Summit in Rio de Janeiro, Brazil in June 1992 and entered into force in December 1993 (JNCC, 2008k). As the first treaty to provide a legal framework for biodiversity conservation, the Convention established three main goals: the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of genetic resources (JNCC, 2008k). Contracting Parties are required to create and enforce national strategies and action plans to conserve, protect and enhance biological diversity. They are also required to undertake action to implement the thematic work programmes on ecosystems and a range of cross-cutting issues which have been established to take forward the provisions of the Convention (JNCC, 2008k).

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

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

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

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

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS) was adopted in Bonn, Germany in 1979 and came into force in 1985 (JNCC, 2008l). Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix 1 of the Convention), concluding multilateral agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix 2), and by undertaking co-operative research activities (JNCC, 2008l). The UK ratified the Convention in 1985 (JNCC, 2008l). The legal requirement for the strict protection of Appendix I species is provided by the Wildlife & Countryside Act (1981 and as amended).

### **D. United Nations Framework Convention on Climate Change**

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

The United Nations Framework Convention on Climate Change was adopted at the Earth Summit in Rio de Janeiro, Brazil in 1992 and came into force on 1994 (JNCC, 2008n). The Convention set a non-binding goal for contracting parties to stabilise their greenhouse emissions to 1990 levels by the year 2000. To this end, parties were required to undertake necessary measures, including the submission of national inventories of greenhouse-gas emissions

and removals, adoption of national programmes for mitigating climate change and developing strategies for adapting to its impacts, and promotion of technology transfer and the sustainable management, conservation, and enhancement of greenhouse gas sinks and 'reservoirs' (such as forests and oceans). In addition, parties were required to take climate change into account in their relevant social, economic, and environmental policies; cooperate in scientific, technical, and educational matters; and promote education, public awareness, and the exchange of information related to climate change (JNCC, 2008n). However, in 1995 it was acknowledged that the commitment of parties to take these measures was not adequate to achieve the aims of the Convention. As a result, the Kyoto Protocol was adopted in 1997 to strengthen the obligations of the Convention. Under the protocol, industrialised countries have a legally binding commitment to reduce their collective greenhouse gas emissions by at least five per cent compared to 1990 levels by the period 2008 – 2012.

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

#### **E. The Convention for the Protection of the Marine Environment of the North-East Atlantic**

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

The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) was adopted in Paris, France in September 1992 and entered into force in March 1998 (JNCC, 2008o). OSPAR replaced both the Oslo and Paris Conventions, with the intention of providing a comprehensive and simplified approach to addressing all sources of pollution which might affect the maritime area, as well as matters relating to the protection of the marine environment other than those relating to the prevention and elimination of pollution. It retained all decisions, recommendations and agreements adopted under the previous Conventions, subject to termination through the adoption of new measures under OSPAR. An OSPAR Commission was established to administer the Convention and to develop policy and international agreements. In July 1998 parties agreed on a new

Annex V on the protection and conservation of the ecosystems and biological diversity of the maritime area and a new appendix 3 with criteria for identifying human activities for the purpose of Annex V (JNCC, 2008o). The Commission has adopted five strategies for directing its work. Measures and programmes within the Biodiversity Strategy include the identification of ecological quality objectives of the North Sea, development of lists of species and habitats in need of protection, identification and selection of marine protected areas, and the prevention and control of adverse impacts from human activities. The UK ratified OSPAR in 1998, and Annex V and Appendix 3 in June 2000 (JNCC, 2008o).

#### **F. The Convention on Wetlands of International Importance especially as Waterfowl Habitat**

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

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

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

development as that afforded to sites which have been designated under the EC Birds and Habitats Directives as part of the EU Natura 2000 network (JNCC, 2008m).

## **G. Council Directive 79/409/EEC on the conservation of wild birds**

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

The main provisions of the Directive include:

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

A very wide range of other statutory and non-statutory activities also support the Bird Directive's implementation in the UK (JNCC, 2008p), including national bird monitoring schemes, bird conservation research and the UK

Biodiversity Action Plan (UKBAP) which involves action for a number of bird species and the habitats which support them.

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

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

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

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

The Habitats Directive introduces the precautionary principle for the first time to protected areas; that is that projects can only be permitted having

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

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

## **I. The Convention Concerning the Protection of the World Cultural and Natural Heritage**

The Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention) was adopted in Paris, France in November 1972 and came into force in December 1975, being ratified in the UK in 1984 (JNCC, 2008r). The Convention is a unique international instrument in that it seeks to protect both cultural and natural heritage and defines the kind of sites which can be considered for inscription of the World Heritage List (ancient monuments, museums, biodiversity and geological heritage all come within the scope of the Convention), setting out the duties of states parties in identifying potential sites and their role in protecting them (JNCC, 2008r). Although many World Heritage sites fall into either the 'cultural' or 'natural' categories, a particularly important aspect of the Convention is its ability to recognise landscapes that combine these values, and where the biological and physical aspects of landscape have evolved alongside human activity (JNCC, 2008r).

## **J. Council Directive 76/160/EEC on the Quality of Bathing Water**

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

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

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

## **K. Shellfish Waters Directive (79/923/EC)**

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

The original Shellfish Waters Directive (79/923/EC), adopted on 30 October 1979, was repealed by the codified Shellfish Waters Directive (2006/113/EC), adopted on 12 December 2006. Codification is a routine procedure that consolidates an existing Directive, with any amendments made since its introduction, into a single, more accessible document (Defra, 2008b). The codified Directive maintains all existing measures which provide for the monitoring and assessment of shellfish waters and the setting of the water

quality standards they are required to achieve (Defra, 2008b). The original Shellfish Waters Directive (79/923/EEC) was transposed into UK legislation through the Surface Waters (Shellfish) Classifications Regulations 1997 and the Surface Waters (Shellfish) Directions 1997 (Defra, 2008b).

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

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

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

## **L. Water Framework Directive (2000/60/EC)**

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

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

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

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

## **M. Council Directive on Environmental Liability (2004/35/EC)**

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

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

- Scope - the Directive does not cover all types of damage to the environment. It only covers 'environmental damage' which is one or more of: 'damage to protected species and natural habitats or in a site of special scientific interest', 'damage to water' and 'land damage';

- The Directive introduces two types of liability: fault-based liability in respect of environmental damage to protected species and natural habitats from all other occupational activities and strict liability in respect of environmental damage, caused by a specified range of 'occupational activities' (described in Annex III of the ELD);
- Reporting environmental damage - operators are required to take immediate steps to prevent damage or further damage and to notify the enforcing authority; and
- Role of enforcing authority - the authority must establish if it is 'environmental damage' and identify a responsible operator.

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

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

## **N. Council Directive on the assessment and management of flood risks (2007/60/EC)**

Directive 2007/60/EC on the assessment and management of flood risks entered into force on 26 November 2007 and now requires Member States to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. With this Directive also reinforces the rights of the public to access this information and to have a say in the planning process.

The Directive aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive requires Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.

The Directive shall be carried out in coordination with the Water Framework Directive, notably by flood risk management plans and river basin management plans being coordinated, and through coordination of the public

participation procedures in the preparation of these plans. All assessments, maps and plans prepared shall be made available to the public.

Member States shall furthermore coordinate their flood risk management practices in shared river basins, including with third countries and shall in solidarity not undertake measures that would increase the flood risk in neighbouring countries. Member States shall take into consideration long term developments, including climate change, as well as sustainable land use practices in the flood risk management cycle addressed in this Directive.

## **O. The Wildlife and Countryside Act 1981**

The Wildlife and Countryside Act 1981 (WCA 1981) consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain. It is complimented by the Wildlife and Countryside (Service of Notices) Act 1985, which relates to notices served under the 1981 Act, and the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), which implement Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive). The Act received royal assent on 30 October 1981 and was brought into force in incremental steps. Amendments to the Act have occurred, the most recent being the Countryside and Rights of Way (CROW) Act 2000 (in England and Wales) and the Nature Conservation (Scotland) Act 2004 (in Scotland). There is also a statutory five-yearly review of Schedules 5 and 8 (protected wild animals and plant respectively), undertaken by the country agencies and co-ordinated by the Joint Nature Conservation Committee. Containing four Parts and 17 Schedules, the Act covers protection of wildlife (birds, and some animals and plants), the countryside, National Parks, and the designation of protected areas, and public rights of way.

### *Wildlife*

The Act makes it an offence (with exception to species listed in Schedule 2) to intentionally kill, injure, or take any wild bird or their eggs or nests. Special penalties are available for offences related to birds listed on Schedule 1, for which there are additional offences of disturbing these birds at their nests, or their dependent young. The Secretary of State may also designate Areas of Special Protection (subject to exceptions) to provide further protection to birds. The Act also prohibits certain methods of killing, injuring, or taking birds, restricts the sale and possession of captive bred birds, and sets standards for keeping birds in captivity.

The Act makes it an offence (subject to exceptions) to intentionally kill, injure, or take, possess, or trade in any wild animal listed in Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places. The Act also prohibits certain methods of killing, injuring, or taking wild animals.

The Act makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants. Animals and plants found on schedules 5 and 8 are listed on a spreadsheet of conservation designations for UK taxa.

The Act contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants listed in Schedule 9. It also provides a mechanism making any of the above offences legal through the granting of licences by the appropriate authorities.

#### *Nature Conservation, Countryside and National Parks*

The Act provides for the notification of Sites of Special Scientific Interest (SSSI) – areas of special scientific interest by reason of their flora, fauna, or geological or physiographical features – by the country agencies. A notification must be served to the relevant local planning authority, all land owners and occupiers, and the Secretary of State, specifying the time period within which representations and objections may be made. The country agencies must consider these responses and may withdraw or confirm the notification, with or without amendment. The Act also contains measures for the protection and management of SSSIs. The Act provides for the making of Limestone Pavement Orders, which prohibit the disturbance and removal of limestone from such designated areas, and the designation of Marine Nature Reserves, for which byelaws must be made to protect them.

The Act prohibits the undertaking of agricultural or forestry operations on land within National Parks which has been either moor or heath for 20 years, without consent from the relevant planning authority. Planning authorities are also required to make available to the public up to date maps of moor and heath land within National Parks, which are important for the conservation of natural beauty.

#### *Public Rights of Way*

The Act requires surveying authorities to maintain up to date definitive maps and statements, for the purpose of clarifying public rights of way. The Act also includes provisions for traffic regulation, ploughing, appointing wardens, signposting, and prohibiting the keeping of bulls on land crossed by public rights of way.

## **P. The Countryside and Rights of Way Act 2000**

The Countryside and Rights of Way Act 2000 (CRoW Act 2000), which applies to England and Wales only, received Royal Assent on 30 November 2000, with the provisions it contains being brought into force in incremental steps over subsequent years. Containing five Parts and 16 Schedules, the Act provides for public access on foot to certain types of land, amends the law relating to public rights of way, increases protection for Sites of Special

Scientific Interest (SSSI) and strengthens wildlife enforcement legislation, and provides for better management of Areas of Outstanding Natural Beauty (AONB). The Act is compliant with the provisions of the European Convention on Human Rights, requiring consultation where the rights of the individual may be affected by these measures.

#### *Access to the Countryside*

The Act provides a new right of public access on foot to areas of open land comprising mountain, moor, heath, down, and registered common land, and contains provisions for extending the right to coastal land. The Act also provides safeguards which take into account the needs of landowners and occupiers, and of other interests, including wildlife.

#### *Public Rights of Way and Road Traffic*

The Act improves the rights of way legislation by encouraging the creation of new routes and clarifying uncertainties about existing rights. Of particular relevance to nature conservation, the Act introduces powers enabling the diversion of rights of way to protect SSSIs.

#### *Nature Conservation and Wildlife Protection*

The Act places a duty on Government Departments and the National Assembly for Wales to have regard for the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity.

Schedule 9 of the Act changes the Wildlife and Countryside Act 1981, amending SSSI notification procedures and providing increased powers for the protection and management of SSSIs. The provisions extend powers for entering into management agreements, place a duty on public bodies to further the conservation and enhancement of SSSIs, and increase penalties on conviction where the provision are breached, with a new offence whereby third parties can be convicted for damaging SSSIs. To ensure compliance with the Human Rights Act 1998, appeal processes are introduced with regards to the notification, management and protection of SSSIs.

Schedule 12 of the Act amends the Wildlife and Countryside Act 1981, strengthening the legal protection for threatened species. The provisions make certain offences 'arrestable', create a new offence of reckless disturbance, confer greater powers to police and wildlife inspectors for entering premises and obtaining wildlife tissue samples for DNA analysis, and enable heavier penalties on conviction of wildlife offences.

#### *Areas of Outstanding Natural Beauty*

The Act clarifies the procedure and purpose of designating AONBs, and consolidates the provisions of previous legislation. It requires local authorities to produce management plans for each AONB, and enables the creation of

Conservation Boards in order to assume responsibility for AONBs, particularly where the land designated crosses several local authority jurisdictions. The Act also requires all relevant authorities to have regard to the purpose of conserving and enhancing the natural beauty of AONBs when performing their functions.

**Q. Town and Country Planning Act 1990**

The purpose of the Town and Country Planning Act 1990 is to better regulate the way in which large and small scale developments were approved by local authorities in England and Wales. For more details regarding the act, please refer to:

[http://www.opsi.gov.uk/acts/acts1990/UKpga\\_19900008\\_en\\_1.htm](http://www.opsi.gov.uk/acts/acts1990/UKpga_19900008_en_1.htm)

**R. The Ancient Monuments and Archaeological Areas Act 1979**

The Ancient Monuments and Archaeological Areas Act 1979 is the latest in a series of Ancient Monument Acts legislating to protect the archaeological heritage of Great Britain.

Section 61(12) defines sites that warrant protection due to their being of national importance as 'ancient monuments'. These can be either Scheduled Ancient Monuments or "*any other monument which in the opinion of the Secretary of State is of public interest by reason of the historic, architectural, traditional, artistic or archaeological interest attaching to it*".

A monument is defined as:

*"any building, structure or work above or below the surface of the land, any cave or excavation; any site comprising the remains of any such building, structure or work or any cave or excavation; and any site comprising or comprising the remains of any vehicle, vessel or aircraft or other movable structure or part thereof (Section 61 (7))"*.

Damage to an ancient monument is a criminal offence and any works taking place within one require Scheduled Monument Consent from the Secretary of State.

The Act also provides for taking monuments into the care of the Secretary of State - the concept of 'guardianship' where a monument remains in private ownership but the monument is cared for and (usually) opened to the public by the relevant national heritage body.

The Act (in Part II) also introduced the concept of Areas of Archaeological Importance, city centres of historic significance which receive limited further protection by forcing developers to permit archaeological access prior to building work starting. The law is administered in England by English Heritage.

## **SUB-ANNEX III**

### **Information pertaining to areas of conservation importance on The Wash coast**

**A. Qualifying features of Ramsar sites within or adjacent to the study area**

<b>Qualifying features for the North Norfolk Coast Ramsar (JNCC, 2008a)</b>
<i>Ramsar criterion 1</i>
The site is one of the largest expanses of undeveloped coastal habitat of its type in Europe.
<i>Ramsar criterion 2</i>
The site supports at least 3 British Red Data Book and nine nationally scarce vascular plants, 1 British Red Data Book lichen and 38 British Red Data Book invertebrates.
<i>Ramsar criterion 5</i>
Assemblages of international importance: 98462 waterfowl (5 year peak mean 1998/99-2002/2003)
<i>Ramsar criterion 6</i>
Qualifying species/populations occurring at levels of international importance (as identified at designation): <b>Species regularly supported during the breeding season:</b> <ul style="list-style-type: none"> <li>• Sandwich tern <i>Sterna sandvicensis sandvicensis</i></li> <li>• Common tern <i>Sterna hirundo hirundo</i></li> <li>• Little tern <i>Sterna albrifrons albrifrons</i></li> </ul> <b>Species with peak counts in spring/autumn:</b> <ul style="list-style-type: none"> <li>• Red knot <i>Calidris canutus islandica</i></li> </ul> <b>Species with peak counts in winter:</b> <ul style="list-style-type: none"> <li>• Pink-footed goose <i>Anser brachyrhynchus</i></li> <li>• Dark-bellied Brent goose <i>Branta bernicla bernicla</i></li> <li>• Eurasian wigeon <i>Anas Penelope</i></li> <li>• Northern pintail <i>Anas acuta</i></li> </ul>

<b>Qualifying features for The Wash Ramsar (JNCC, 2008b)</b>
<i>Ramsar criterion 1</i>
The Wash is a large shallow bay comprising very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels.
<i>Ramsar criterion 3</i>
Qualifies because of the inter-relationship between its various components including saltmarshes, intertidal sand and mud flats and the estuarine waters. The saltmarshes and the plankton in the estuarine water provide a primary source of organic material which, together with other organic matter, forms the basis for the high productivity of the estuary.
<i>Ramsar criterion 5</i>
Assemblages of international importance: 292541 waterfowl (5 year peak mean 1998/99-2002/2003)
<i>Ramsar criterion 6</i>
Qualifying species/populations occurring at levels of international importance (as identified at designation): <b>Species with peak counts in spring/autumn:</b> <ul style="list-style-type: none"> <li>• Eurasian oystercatcher <i>Haematopus ostralegus ostralegus</i></li> </ul>

**Qualifying features for The Wash Ramsar (JNCC, 2008b)**

- Grey plover *Pluvialis squatarola*
- Red knot *Calidris canutus islandica*
- Sanderling *Calidris alba*
- Eurasian curlew *Numenius arquata arquata*
- Common redshank *Tringa totanus totanus*
- Ruddy Turnstone *Arenia interpres interpres*

**Species with peak counts in winter:**

- Pink-footed goose *Anser brachyrhynchus*
- Dark-bellied Brent goose *Branta bernicla bernicla*

**Qualifying features for the Gibraltar Point Ramsar (JNCC, 2008c)**

*Ramsar criterion 1*

The dune and saltmarsh habitats present on the site are representative of all the stages of colonization and stabilisation. There is a fine example of freshwater marsh containing sedges *Carex* spp., rushes *Juncus* spp., and ferns, including adder's-tongue fern *Ophioglossum vulgatum*. Also most northerly example of nationally rare saltmarsh/dune communities containing sea heath *Frankenia laevis*, rock sea lavender *Limonium binervosum* and shrubby seablite *Suaeda vera*.

*Ramsar criterion 2*

Supports an assemblage of wetland invertebrate species of which eight species are listed as rare in the British Red Data Book and a further four species listed as vulnerable.

*Ramsar criterion 5*

Assemblages of international importance:  
53072 waterfowl (5 year peak mean 1998/99-2002/2003)

*Ramsar criterion 6*

Qualifying species/populations occurring at levels of international importance (as identified at designation):

**Species with peak counts in spring/autumn:**

- Grey plover *Pluvialis squatarola*;
- Sanderling *Calidris alba*;
- Bar-tailed godwit *Limosa lapponica lapponica*; and
- Red Knot *Calidris canutus islandica*.

**Species with peak counts in winter:**

- Dark-bellied Brent goose *Branta bernicla bernicla*

**B. Qualifying features of Special Areas of Conservation within or adjacent to the study area**

<b>Qualifying features for The Wash and North Norfolk Coast SAC site (JNCC, 2008d)</b>	
<b>Qualifying feature</b>	<b>Description</b>
<i>Annex I habitats that are a primary reason for selection of this site</i>	
	<ul style="list-style-type: none"> <li>• Sandbanks that are slightly covered by seawater all the time;</li> <li>• Mudflats and sandbanks not covered by seawater at low tide;</li> <li>• Large shallow inlets and bays;</li> <li>• Reefs;</li> <li>• <i>Salicornia</i> and other annuals colonising mud and sand;</li> <li>• Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>);</li> <li>• Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>).</li> </ul>
<i>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</i>	
Coastal lagoons	
<i>Annex II species that are a primary reason for the selection of this site</i>	
Common Seal <i>Phoca vitulina</i>	
<i>Annex II species that are present as a qualifying feature, but not a primary reason for site selection</i>	
Otter <i>Lutra lutra</i>	

<b>Qualifying features for North Norfolk Coast SAC site (JNCC, 2008e)</b>	
<b>Qualifying feature</b>	<b>Description</b>
<i>Annex I habitats that are a primary reason for selection of this site</i>	
	<ul style="list-style-type: none"> <li>• Coastal lagoons;</li> <li>• Perennial vegetation of stony banks;</li> <li>• Mediterranean and thermo-Atlantic halophilous scrubs;</li> <li>• Embryonic shifting dunes;</li> <li>• Shifting dunes along the shoreline with <i>Ammophila aernaria</i>;</li> <li>• Fixed dunes with herbaceous vegetation; and</li> <li>• Humid dune slacks.</li> </ul>
<i>Annex II species that are present as a qualifying feature, but not a primary reason for site selection</i>	
Otter <i>Lutra lutra</i>	
Petalwort <i>Petalophyllum ralfsii</i>	

<b>Qualifying features for The Saltfleetby-Theedlethorpe Dunes and Gibraltar Point SAC site (JNCC, 2008f)</b>	
<b>Qualifying feature</b>	<b>Description</b>
<i>Annex I habitats that are a primary reason for selection of this site</i>	
	<ul style="list-style-type: none"> <li>• Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white)</li> </ul>

Qualifying features for The Saltfleetby-Theedlethorpe Dunes and Gibraltar Point SAC site (JNCC, 2008f)	
Qualifying feature	Description
<i>Annex I habitats that are a primary reason for selection of this site</i>	
	dunes`); <ul style="list-style-type: none"> <li>• Fixed dunes with herbaceous vegetation (`grey dunes`);</li> <li>• Dunes with Hippophae rhamnoides;</li> <li>• Humid dune slacks</li> </ul>
<i>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</i>	
Embryonic shifting dunes	

**C. Qualifying features of Special Protection Areas within or adjacent to the study area**

Qualifying features for The Wash SPA (JNCC, 2008g)
<i>Article 4.1 Qualification (79/409/EEC)</i>
<b>During the breeding season the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Little tern <i>Sterna albifrons</i>; and</li> <li>• Common tern <i>Sterna hirundo hirundo</i></li> </ul>
<b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Bewick's Swan <i>Cygnus columbianus bewickii</i>; and</li> <li>• Bar-tailed Godwit <i>Limosa lapponica</i>.</li> </ul>
<i>Article 4.2 Qualification (79/409/EEC)</i>
<b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Pintail <i>Anas acuta</i>;</li> <li>• Eurasian wigeon <i>Anas Penelope</i>;</li> <li>• Gadwall <i>Anas strepera</i>;</li> <li>• Pink-footed goose <i>Anser brachyrhynchus</i>;</li> <li>• Ruddy Turnstone <i>Arenaria Interpres</i>;</li> <li>• Brent Goose <i>Branta bernicla bernicla</i>;</li> <li>• Common goldeneye <i>Bucephala clangula</i>;</li> <li>• Sanderling <i>Calidris alba</i>;</li> <li>• Dunlin <i>Calidris alpina alpina</i>;</li> <li>• Common oystercatcher <i>Haematopus ostralegus</i>;</li> <li>• Black-tailed Godwit <i>Limosa limosa islandica</i>;</li> <li>• Common Scoter <i>Melanitta Nigra</i>;</li> <li>• Curlew <i>Numenius arquata</i>;</li> <li>• Grey plover <i>Pluvialis squatarola</i>;</li> <li>• Shelduck <i>Tadorna tadorna</i>; and</li> <li>• Redshank <i>Tringa tetanus</i>.</li> </ul>

<b>Qualifying features for the North Norfolk Coast SPA (JNCC, 2008h)</b>
<i>Article 4.1 Qualification (79/409/EEC)</i>
<b>During the breeding season the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Bittern <i>Botaurus stellaris</i>;</li> <li>• Marsh harrier <i>Circus aeruginosus</i>;</li> <li>• Avocet <i>Recurvirostra avosetta</i>;</li> <li>• Little tern <i>Sterna albrifrons</i>;</li> <li>• Little tern <i>Sterna hirundo</i>; and</li> <li>• Sandwich tern <i>Sterna sandvicensis</i>.</li> </ul> <b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Avocet <i>Recurvirostra avosetta</i>.</li> </ul>
<i>Article 4.2 Qualification (79/409/EEC)</i>
<b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Eurasian wigeon <i>Anas Penelope</i>;</li> <li>• Pink-footed goose <i>Anser brachyrhynchus</i>;</li> <li>• Brent Goose <i>Branta bernicla bernicla</i>; and</li> <li>• Knot <i>Calidris canutus</i>.</li> </ul>

<b>Qualifying features for the Gibraltar Point SPA (JNCC, 2008i)</b>
<i>Article 4.1 Qualification (79/409/EEC)</i>
<b>During the breeding season the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Little tern <i>Sterna albifrons</i>;</li> </ul> <b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Bar-tailed Godwit <i>Limosa lapponica</i>.</li> </ul>
<i>Article 4.2 Qualification (79/409/EEC)</i>
<b>Over winter the area regularly supports:</b> <ul style="list-style-type: none"> <li>• Grey plover <i>Pluvialis squatarola</i>; and</li> <li>• Knot <i>Calidris canutus</i></li> <li>• Over winter, the area regularly supports 22,137 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Oystercatcher <i>Haematopus ostralegus</i>, Knot <i>Calidris canutus</i>, Grey Plover <i>Pluvialis squatarola</i>, Bar-tailed Godwit <i>Limosa lapponica</i>.</li> </ul>

**D. Sites designated under national conservation legislation within the study area**

<b>SSSI name</b>	<b>Site Features</b>
Gibraltar Point	Gibraltar Point is a nationally important site due to its sand dunes and other coastal habitats, and associated fauna, notably invertebrates and passage and breeding birds. Gibraltar Point is also of great importance for its coastal geomorphology (Natural England, 2009a)
The Wash	The whole of the Wash is of exceptional biological interest. The intertidal mudflats and saltmarshes represent one of Britain's most important winter feeding areas for waders and

<b>SSSI name</b>	<b>Site Features</b>
	wildfowl outside of the breeding season. Enormous numbers of migrant birds, of international significance, are dependent on the rich supply of invertebrate food. The saltmarsh and shingle communities are of considerable botanical interest and the mature saltmarsh is a valuable bird breeding zone. In addition the Wash is also very important as a breeding ground for Common Seals (Natural England, 2009b)
Dersingham Bog	Dersingham Bog is the largest and most intact example of an acid valley mire in East Anglia. The site lies in the Lower Greensand zone with Sandringham Sands exposed in an old sandpit. The mire itself lies on shallow peat and has extensive areas dominated by bog mosses with several locally rare species of plant. The mire is bordered on one side by an escarpment, which marks the edge of an ancient coastline, which has large areas of heathland on its slopes. Self-regenerating pine woodland has developed on the top of the escarpment. The site also has considerable ornithological and entomological interest (Natural England, 2009c).

<b>NNR name</b>	<b>Site Features</b>
Dersingham Bog	Dersingham NNR forms part of the Sandringham Royal Estate and is home to a wide variety of habitats including dry and wet heathland, acid valley mire and deciduous and coniferous woodland. Acid valley mire is found in the low-lying parts of the reserve where the ground is waterlogged for most of the year. Dersingham contains the largest example of this habitat in East Anglia, and many specialised plants such as bog asphodel, round-leaved sundew, cranberry and white-beaked sedge grow there.
The Wash	The Wash NNR is a mix of open deep water, permanent shallow water, mudflat and saltmarsh. The intertidal mudflats and saltmarshes represent one of Britain's most important winter feeding areas for waders and wildfowl. The Outer Trial Bank, an artificial island, is an important site for breeding seabirds. Common Seals pup on the sandbanks during the summer.

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## **SUB-ANNEX IV**

### **Further Information**

## **Unit 1 - Gibraltar Point to Wrangle**

### *Primary area of search*

The area between Gibraltar Point and Wrangle is low lying and extensive areas lie within the 1 in 100 year flood zone. This is a result of the progressive reclamation of coastline which has occurred, reflected in the extensive array of flood defences present in the area with up to three lines of flood banks present in some lengths of the reach.

Little settlement has taken place between the A52 and the shoreline, with only occasional isolated properties and few surfaced roads. Some aggregation of built properties occurs in the vicinity of Wrangle, with a corresponding presence of surfaced roads.

Land in this area is of high arable agricultural value, this being the sole land use in the area. The area is of low amenity and conservation value, which contrasts with the area seaward of the primary flood defence, which comprises saltmarsh and mudflats, and is of high conservation value

Much of the offshore area is also of significant military importance as a weapons training range for the Ministry of Defence.

### *Secondary area of search*

A significant increase in the degree of settlement is observed immediately inland of the A52, both in terms of isolated properties, smaller settlements and the larger settlements of Wainfleet All Saints and Friskney. This area is served by a network of minor roads.

Moving inland from the belt of settlement immediately landward of the A 52, the density of settlement decreases, and primarily comprises disparate properties, and remains as such throughout the remainder of the 1 in 1000 year flood zone. Other than the network of minor roads present in this area, the only infrastructure is the Skegness to Boston Railway, and Power lines and pylons running from north east to south west.

The landscape of the area is characterised by arable agriculture and few natural, heritage or landscape features other than some isolated patches of woodland.

## **Unit 2 – Wrangle to Boston**

### *Primary area of search*

The land in this reach is low lying and within the 1 in 100 year flood zone and up to three lines of flood defences are present along the reach.

The area is significantly more populated than Unit 1 above, with a number of small settlements including Freiston, Fishtoft, the Levertons and the largest, Butterwick; as well as other more disparate housing.

Land in this area is of high arable agricultural value, this being the dominant land use in the area. The area is of low conservation value, except for the identified wildlife sites in the Boston Borough Interim Plan, which includes the Benington Gull, which contrasts with the area seaward of the primary flood defence, which comprises saltmarsh and mudflats, and is of high conservation value.

#### *Secondary area of search*

Although the primary area of search is significantly more populated than in unit 1, significant settlement is also present landward of the A52 including Leverton, Bennington, Boston Long Hedges, Leake Commonside and Old Leake. Boston comprises a major urban settlement within the area and represents not only a major residential concentration, but a service centre for the area and Region. Old Leake is possibly the most significant settlement after Boston with its secondary school and high amenity value.

Infrastructure in this unit comprises the A 16, the Boston to Skegness railway line and the network of B and minor roads serving various settlements and properties.

The landscape of the area is characterised by arable agriculture with a few natural, features including Hobhole Drain, Cowbridge Drain and the Haven.

### **Unit 3 – Boston to Fosdyke**

#### *Primary area of search*

The land in this reach is low lying and within the 1 in 100 year flood zone and two lines of flood defences are present along much of the reach.

The settlement pattern in this reach is similar to that in Unit 2 with a number of small settlements, including Fosdyke, Skelldyke and Frampton, as well as other smaller settlements and properties. A network of minor roads exists to serve these settlements and properties.

Land in this area is of high arable agricultural value, this being the main land use in the area. Amenity in the area includes a boat yard at Fosdyke and a land fill at Slippery Gowt. A new distribution/industrial park is being constructed east of the A16 at Kirton. The area seaward of the primary flood defence, which comprises a significant area of saltmarsh, as well as mudflats, is of high conservation value.

The inland component of the reach contains a zone of archaeological potential at Fosdyke, and amenity benefits are present in the form of the Local Nature Reserve at Frampton Marsh.

The two waterways which border this SMP reach, the Haven and River Welland and thus their offshore approaches, are important routes for commercial boating traffic. This is particularly true for the Haven, which allows access to the Port of Boston.

#### *Secondary area of search*

Significant settlements are present immediately landward of the A16, Namely Boston, Wyberton, Kirton, and Sutterton. Further inland, additional settlements are present, namely Swineshead, Bicker, Donington, Quadring, Gosberton, Pinchbeck and Spalding. Smaller settlements and disparate properties are also present in the area.

Several A and B roads are present in this area including the A52, A17 A16, A152 and B1397 as are various minor roads serving the network of settlements. Additional infrastructure includes the Lincoln to Spalding Railway, and the various electricity lines.

Land use in the area is predominantly arable agriculture and few natural or landscape features are present in the reach.

### **Unit 4 – Fosdyke to Fleet Haven**

#### *Primary area of search*

The land in this reach is low lying and within the 1 in 100 year flood zone and has two lines of flood defences along most of the reach.

The reach area comprises disparate properties and settlements, which increase in number and size towards the A17 and Holbeach. The larger settlements in this reach include Holbeach St. Matthew, Holbeach St. Marks and Holbeach Clough. A network of minor roads exists to serve these properties, which is sparse towards the coastline, and more developed towards the A17 / Holbeach area.

Land in this area is of high arable agricultural value, with this being the sole land use. The area seaward of the primary flood defence, which comprises significant saltmarsh and mudflats, is of high conservation value. Much of the offshore area is also of significant military importance as a weapons training range.

#### *Secondary area of search*

Low lying land in this area extends significantly inland, with much of this at, or below sea level.

In common with other areas of the wash, a significant increase in settlement is present landward of the main road (in this case the A151 and A17), with Moulton Sea End, Weston, Moulton and the largest settlement, Holbeach, all present in this area. Further inland of this line of settlements, properties are disparate and few in number.

Infrastructure in the area comprises the A151, which is significant in connecting Spalding to the settlements to the east (those named above), and in addition various B roads and minor roads.

Land use in this area is predominantly arable agriculture, with few natural, heritage or landscape features present.

## **Unit 5 – Fleet Haven to Guy’s Head**

### *Primary area of search*

The land in this reach is low lying and within the 1 in 100 year flood zone and has two lines of flood defences along the entire reach.

The unit area comprises disparate properties and small settlements, namely Gedney Drove End adjacent to the shoreline and Gedney Dyke, Lutton and Chapelgate, each of which are further inland, and in close proximity to the larger settlement and service centres of Long Sutton and Sutton Bridge.

The area is served by a sparse network of minor roads, and one B road (B1359) between Gedney Drove End, Gedney Dyke, Chapelgate, Long Sutton and Sutton Bridge.

Land in this area is of high arable agricultural value, this being the sole land use in the area. The area seaward of the primary flood defence, which comprises a significant area of saltmarsh, as well as mudflats, is of high conservation value. Much of the offshore area is also of significant military importance as a weapons training range.

The Port of Sutton Bridge is of economic importance both locally and regionally.

### *Secondary area of search*

Low lying land in this area extends significantly inland, with much of this at, or below sea level.

In the secondary area of search a number of small settlements are present, including Sutton St James, Tydd St Mary, Tydd St Giles, Tydd Gote, Newton

and Gorefield. The most significant settlement in the reach is Wisbech. Numerous disparate properties are also present in the area.

The most significant road in the reach is the A1101, which connects the A17 at Long Sutton with Wisbech via Tydd St Mary and Newton. The B1390 and B1165 represent a further significant transport route, connecting Long Sutton, Sutton St. James, Tydd St. Giles and Newton. A network of minor roads also exists, serving the villages and disparate properties present. Various electricity lines are present in the area.

Land use in the area is predominantly arable agriculture, although several orchards are also present. The area has few natural, heritage or landscape features although the North Level Main Drain and the South Holland Main Drain both run through the area.

## **Unit 6 – Sutton Bridge to River Great Ouse**

### *Primary area of search*

The land in this reach is low lying and within the 1 in 100 year flood zone and has two and over some lengths, three lines of flood defences.

The settlement pattern in this unit is similar to that of the previous two units whereby the area closest to the shoreline is sparsely populated, with a handful of disparate properties, with the three significant settlements in the area: Walpole Cross Keys; Terrington St Clement; and Clenchwarton; being further inland, close to the A 17.

Land in this area is of high arable agricultural value, with this being the sole land. The area seaward of the primary flood defence, which comprises significant saltmarsh and mudflats, is of high conservation value. Much of the offshore area is also of significant military importance as a weapons training range.

The Wash National Nature Reserve, which occupies much of the coastal offshore length of the unit, affords significant amenity, educational and conservation value, as does the Peter Scot Walk, which follows the primary flood defence.

### *Secondary area of search*

Low lying land in this area extends significantly inland, with much of this at, or below sea level.

The area comprises a number of smaller settlements including Walpole St. Peter, Walpole St Andrew, West Walton, Walton Highway, Terrington St John, Wiggenhall St. Mary the Virgin and St John's End. Additionally, a

number of disparate properties out with these settlements are present. The most significant settlement in the area is Wisbech.

The A47, which transects the area, represents a significant transport link of regional significance, as it links Wisbech, and the wider road network to the east, to King's Lynn and the North Norfolk coast. In addition to this, a network of minor roads is present, connecting the various settlements and disparate properties. The electricity lines present in previous units continue through this area.

Land use in the area is predominantly arable agriculture, although in common with the adjacent unit a number of orchards are also present. The Smeeth Lode and Middle Level Main Drain both run through the area, prior to discharging to the River Great Ouse.

## **Unit 7 – River Great Ouse to Wolferton Creek**

### *Primary area of search*

The land in this reach is low lying and within the 1 in 100 year flood zone and has two lines of flood defences along its length. However, unlike the previous units, the area of low lying land extends a relatively short distance inland, with the land rising sharply towards the A149 and King's Lynn.

Unlike previous units, settlements within this unit are concentrated within the larger towns, notably King's Lynn and South and North Wooton, with few disparate properties present in the area. Two smaller settlements are present in the reach, Castle Rising and Wolferton.

Land in this area is of high arable agricultural value, with this being the sole land use in the area. The area seaward of the primary flood defence, which comprises significant saltmarsh and mudflats, is of high conservation value. Much of the offshore area is also of significant military importance as a weapons training range. The other significant natural feature in the unit is the Babingley River, which has some conservation, amenity and angling value, albeit that it is heavily modified in its lower reaches.

The Wash National Nature Reserve, which occupies much of the coastal offshore length of the unit, affords significant amenity, educational and conservation value, as does the Peter Scot Walk, which follows the primary flood defence.

### *Secondary area of search*

Due to the proximity of higher land to the shoreline in this area, no flood or erosion prone land is present inland of the primary area of search. This area will not therefore be considered further.

## **Unit 8 – Wolferton Creek to Snettisham Scalp**

### *Primary area of search*

The land in this area is similar to that of Unit 8 whereby the area of flat, low lying land is relatively small, with the land rising sharply near the A149 and Dersingham and Ingoldisthorpe. A single flood bank is present along the shoreline.

No built properties are present within this reach other than at Shepherd's Port, which also encompasses a large camping and Caravan site. Thus, other than farm tracks, and a minor road between Shepherd's Port and Snettisham, no surfaced roads are present in the reach.

Land in this area is of high arable agricultural value, and although this is the predominant land use in the unit, the size of fields in this unit is smaller, and the pattern of drainage less intensive and artificial than in areas further west. Natural features in this reach are Boathouse Creek, the Ingol and the series of water bodies which run the length of the unit at the shoreline. These afford the landward part of the unit some limited conservation and recreation (angling) value. The sandy shoreline along this reach provides amenity value.

A further change in the character of the shoreline occurs in this unit, with saltmarsh being absent north of Wolferton Creek. Significant areas of sand and mudflat are nonetheless present.

### *Secondary area of search*

Due to the proximity of higher land to the shoreline in this area, no flood- or erosion-prone land is present inland of the primary area of search. This area will not therefore be considered further.

## **Unit 9 – Snettisham Scalp to Old Hunstanton**

### *Primary area of Search*

The increasing proximity of high ground to the coastline observed in the previous two units continues in Unit 9, with no significant area of low lying land present. Nonetheless, a single flood bank is present along the unit shoreline. Virtually all settlement is present in the three large population centres, Heacham, Hunstanton and Old Hunstanton.

The arable agriculture present in other areas of Wash hinterland are virtually absent from this reach, with land use being predominantly livestock grazing. This area comprises a higher level of natural features than other areas, with the presence of remnant river channels and creeks, which now form ox-bow lakes landward of the flood bank, and seaward of the flood bank in the form of Heacham Harbour. The Heacham River also represents a relatively

unmodified river in the context of the Wash SMP area and thus represents some conservation and amenity value.

As with the previous unit, salt marsh habitat is absent from this reach, with extensive sandy foreshore present. This presents significant amenity and recreational value, which is of economic value to the area.

### *Secondary area of search*

Due to the proximity of higher land to the shoreline in this area, no flood or erosion prone land is present inland of the primary area of search. This area will not therefore be considered further.

## **Geology and Hydrogeology**

### *Geology*

The solid Jurassic geology of the western part of The Wash is completely obscured by more recent deposits. North and east of a line between Wainfleet St Mary and Snettisham, Cretaceous strata form the upper-most solid geology. However, this too is mostly buried, except at Hunstanton where the cliffs expose an extraordinary sequence of Lower Greensand overlain by Red and then White Chalk (Murby, 1997).

During the Anglian glacial period (about 300,000 to 250,000 years ago) the entire area was overwhelmed by a vast ice-sheet hundreds of metres in depth. When the ice eventually melted it left the covering of glacial till which remains today. The exact extent of the ice sheet that came with the last glaciation (The Devensian) is not known but it probably stopped somewhere across the middle of the Wash (Murby, 1997). The Devensian till cliffs, which outcrops on the eastern side of The Wash south of Hunstanton, is the most southerly known British deposit from the last glacial period that ended about 15,000 years ago. However, across most of the Wash, even the most recent glacial deposits are covered with even more recent post-glacial fluvial and marine sediments (Murby, 1997).

The Wash, as we know it today, is an immature shallow marine basin still in the making. The mud, sand and gravel laying on the surface of the sea bed, intertidal areas and the enclosed hinterland have been deposited there in the past 6,000 years or so by the action of the sea or rivers (Murby, 1997). Intertidal peat exposures at Hunstanton are the remnants of a post-glacial freshwater dominated landscape. The deepest part of The Wash is a central channel of over 50 metres at the mouth. However, this channel, known as The Well, rises steeply to a level of about -20 metres (Murby, 1997). From this trench the seabed slopes far more gently up to the shore, with the majority of The Wash being 10 metres or less in depth (Murby, 1997).

The bottom deposits of The Wash range from gravel, through sand to finer muds. The central main channel at the mouth is characterised by a high proportion of gravel (Murby, 1997). Moving closer to the shore, sand, mixed with varying amounts of gravel or mud, dominates large shallow subtidal areas. Higher up the foreshore, particularly where the Great Ouse and Welland drain into the Wash, fine muddy sediments are typical (Murby, 1997).

Although the waves that enter The Wash from the North Sea can have local effects, particularly on the Norfolk shoreline, the enclosed shallow nature and orientation of the embayment reduce their power and impacts considerably. The main driving force is the tide which rises and falls twice a day (Murby, 1997). The average spring tide range is 6.5 meters between high and low water levels at the mouth of The Wash - the highest on the east coast of Britain (Murby, 1997). Tidal currents, associated with these tides, move sediments into, out of and within the Wash. These currents and the availability of sediment in the region's coastal zone are responsible for the shape and overall nature of the embayment (Murby, 1997).

Since the last ice-age The Wash has been a sediment sink - that is to say that there has been a net accumulation of mud, sand and gravel within it. A small proportion of this sediment has come from the Fenland rivers. However, the vast majority is of marine origin. Approximately 6.8 million tons of sediment enters The Wash each year from the sea, mostly from the north (Murby, 1997). Although it is very difficult to demonstrate the origin of this sediment, the indications point to the eroding nearshore sea bed off central Lincolnshire and the Holderness coast of East Yorkshire as the most significant sources (Murby, 1997). Whilst much sediment settles within the Wash, some moves seaward again on to the North Norfolk coast.