



**Kelling to Lowestoft Ness Shoreline Management Plan:  
Strategic Environmental Assessment – Volume 2 Environmental Report**

North Norfolk District Council  
January 2013

  
Prepared by: .....  
Charlotte Clinton  
Environmental Scientist

  
Approved by: .....  
Nigel Pilkington  
Regional Director

Kelling to Lowestoft Ness Shoreline Management Plan Strategic Environmental Assessment

Rev No	Comments	Date
3	Final SEA Environmental Report	January 2013
2	Updated following comments from Coastal Group	December 2009
1	Draft SEA Environmental Report	February 2009

AECOM House, 179 Moss Lane, Altrincham, Cheshire, WA15 8FH  
Telephone: 0161 927 8200 Website: <http://www.aecom.com>

Job No 60052694

Reference

Date Created February 2009

This document has been prepared by AECOM Limited ("AECOM") for the sole use of our client (the "Client") and in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between Faber Maunsell and the Client. Any information provided by third parties and referred to herein has not been checked or verified by Faber Maunsell, unless otherwise expressly stated in the document.

No third party may rely upon this document without the prior and express written agreement of AECOM.

# Volume 2 Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>5</b>
1.1	Introduction .....	5
1.2	Shoreline Management Plan .....	5
1.3	Project Background.....	5
1.4	Strategic Environmental Assessment.....	6
1.5	Habitat Regulations Assessment.....	11
1.6	Retrospective Water Framework Directive Assessment .....	11
<b>2</b>	<b>Kelling to Lowestoft Ness Shoreline Management Plan .....</b>	<b>12</b>
2.1	Introduction .....	12
2.2	Objectives of the Kelling to Lowestoft Ness Shoreline Management Plan .....	13
2.3	SMP Policy options .....	13
2.4	SMP Policy Units .....	13
<b>3</b>	<b>Relevant Plans and Programmes .....</b>	<b>15</b>
3.1	Introduction .....	15
3.2	Implications of the relevant plans and programmes for the SMP .....	18
<b>4</b>	<b>SEA Topics .....</b>	<b>22</b>
4.1	Introduction .....	22
4.2	SEA Topics .....	22
<b>5</b>	<b>Assessment Methodology.....</b>	<b>24</b>
5.1	Introduction .....	24
5.2	Methodology .....	24
5.3	Evaluation Criteria.....	25
5.4	Cumulative Effects .....	26
5.5	Mitigation Measures.....	26
<b>6</b>	<b>Baseline.....</b>	<b>27</b>
6.1	Introduction .....	27
6.2	Protected sites and species .....	28
6.3	Water Quality .....	37
6.4	Climate .....	38
6.5	Landscape .....	39
6.6	Archaeology and the Historic Environment .....	42
6.7	Population .....	42
6.8	Human Health .....	45
6.9	Policy Unit Characteristics .....	45
<b>7</b>	<b>Key Issues.....</b>	<b>59</b>
7.1	Introduction .....	59
<b>8</b>	<b>Results of the assessment on the policy units.....</b>	<b>81</b>
8.1	Introduction .....	81
<b>9</b>	<b>Cumulative Effects.....</b>	<b>119</b>
9.1	Introduction .....	119
<b>10</b>	<b>Mitigation .....</b>	<b>149</b>
10.1	Introduction .....	149
<b>11</b>	<b>Monitoring.....</b>	<b>155</b>
11.1	Introduction .....	155
11.2	Purpose of Monitoring.....	155

11.3	Monitoring the SEA of the SMP .....	155
<b>12</b>	<b>Conclusion.....</b>	<b>158</b>
12.1	Introduction .....	158
12.2	Results of the SEA.....	158
12.3	Next Steps .....	159
<b>Appendix 1.1 .....</b>		<b>161</b>
<b>Appendix 1.2 .....</b>		<b>173</b>

# 1 Introduction

## 1.1 Introduction

This Environmental Report (ER) has been prepared as part of the Strategic Environmental Assessment (SEA) of the Kelling to Lowestoft Ness Shoreline Management Plan (SMP). The report presents the findings from the SEA, identifies options for mitigating adverse effects and opportunities for enhancing or improving the overall sustainability of the policies to be set out in the SMP.

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

This SEA has been carried out in accordance with the European Directive (2001/42/EC) (transposed into English and Welsh Regulations (SI 1633 / 1656, 2004)) and has followed guidance set out in the January 2009 'Strategic Environmental Assessment (SEA) – internal plans and strategies' Guidance Document produced by the Environment Agency's Environmental Assessment Service (NEAS).

## 1.2 Shoreline Management Plan

### 1.2.1 *Overview of the Shoreline Management Plan*

The SMP provides a large-scale assessment of the risks associated with coastal evolution and presents a policy framework to address these risks to people and the developed, historic and natural environment in a sustainable manner. In doing so, the SMP is a high-level document that forms an important part of the Defra's strategy for flood and coastal defence.

## 1.3 Project Background

### 1.3.1 *SMP Activities to Date*

The SMP work along this stretch of the coastline began in 1996 with the publication of two SMPs. The majority of this section was covered in an SMP for the area between Sheringham and Lowestoft and a small section was covered by the Snettisham to Sheringham SMP. In November 2004 the SMP was first published in draft for consultation with the final plan published in March 2006 entitled the 'First Review' of the Kelling to Lowestoft Ness section of the coast in a pilot study testing the implementation of the new SMP guidance.

After an extensive consultation exercise the three council's and the Environment Agency have amended and/or accepted different versions of the SMP and there are now currently three versions in use, these are detailed below:

1. The original plan, dated November 2006 (referred to hereafter as the '2006 SMP') (first published in draft for consultation November 2004)
2. An amended version of that plan, still dated November 2006, produced by Great Yarmouth Borough Council
3. A second amended plan, dated August 2007, prepared by North Norfolk District Council

Based on this complicated history, AECOM has been commissioned to provide an SMP with 'unified text' for formal adoption by all three authorities and the Environment Agency. Thus the 2006 plan, and its two amended versions, will be used as the basis for a single plan which can then be approved. In order to assess the effects of the revised SMP, it must be subjected to Appropriate Assessment and Strategic Environmental Assessment, and be checked for Water Framework Directive compliance.

## 1.4 Strategic Environmental Assessment

### 1.4.1 SEA Directive

The objectives of the SEA Directive, as set out in Article 1, are *"to provide a high level of protection to 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"*.

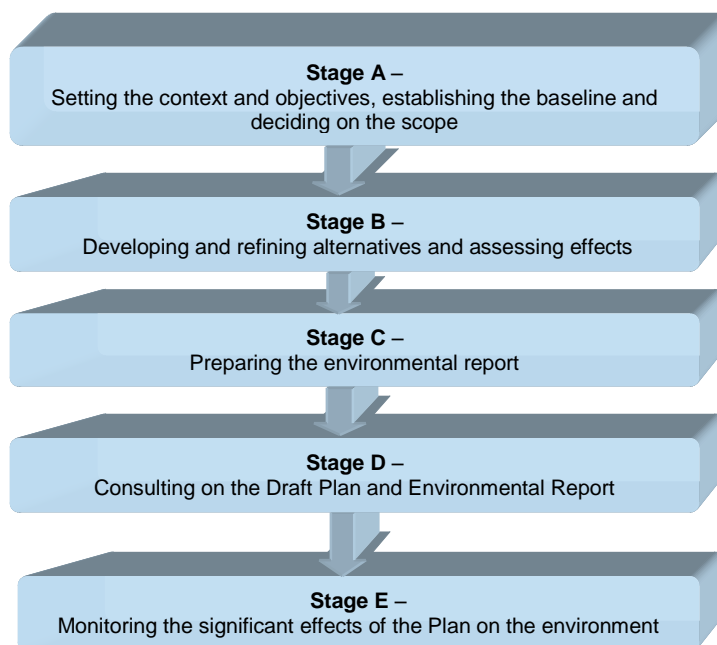
### 1.4.2 Requirements of the SEA Directive

The UK Governments main guidance note on SEA 'A Practical Guide to the Strategic Environmental Assessment Directive' (ODPM September 2005) sets out guidance for the practical application of the Directive within England and Wales.

The guidance breaks the requirements of the SEA Directive down into a series of 'Stages' (Stages A to E). Each of these stages will inform and interact with the assessment of the SMP. Figure A below sets illustrates the stages of the SEA process. The SEA process is iterative in its approach and is designed to inform the development of the plan by ensuring the most environmentally sustainable policies are selected. Therefore this SEA has assessed a range of alternative policy options for each unit including a more detailed assessment of the preferred policy options. The assessment of effects and alternatives is presented within this Environmental Report. The Environmental Report is designed to inform the reader the approach used in undertaking the assessment, where any significant effects have been identified and sets out the proposed methods of avoiding / mitigating the effect.

The main requirements of the SEA Directive include: the preparation of an environmental report; consultation; taking the results of the environmental assessment and consultations into account in decision-making; providing information on the decision making; and setting out a monitoring strategy / plan. The guidance breaks the requirements of the SEA Directive down into a series of 'Stages' (Stages A to E). Each of these stages will inform and interact with the assessment of the SMP. Figure A below sets out the stages of the SEA process.

Figure A: Stages in the SEA Process



The SEA Directive identifies a number of the key tasks under each of the stages of the process. Table 1.1 below lists the main requirements of each of the five stages of the SEA process.

Table 1.1: Requirements of the SEA Directive

SEA Stages
<b>Stage A: Setting the Context, Establishing the Baseline and Deciding the Scope:</b> <ul style="list-style-type: none"> <li>➤ Identify key environmental issues</li> <li>➤ Identification/collection of baseline data</li> <li>➤ Identify relevant plans, programmes and environmental protection objectives</li> <li>➤ Consult with authorities with environmental responsibilities on scope of SEA</li> </ul>
<b>Stage B: Developing and Refining Alternatives and Assessing Effects:</b> <ul style="list-style-type: none"> <li>➤ Predict the effects of the SMP on the environment</li> <li>➤ Use significance criteria to evaluate the effects of the SMP the environment</li> <li>➤ Outline potential measures to mitigate against any adverse effects</li> <li>➤ Propose measures to monitor the environmental effects of the SMP</li> </ul>
<b>Stage C: Preparing the Environmental Report</b> <ul style="list-style-type: none"> <li>➤ Present the findings of the SEA in an Environmental Report</li> <li>➤ Ensure the Environmental Report is accessible to all interested parties</li> </ul>
<b>Stage D: Consulting and Decision Making:</b> <ul style="list-style-type: none"> <li>➤ Consult with Natural England, English Heritage and other key stakeholders</li> <li>➤ Incorporate comments received from consultation and findings of the Environmental Report into development of the SMP</li> <li>➤ Issue a 'statement' (SEA Statement or Post Adoption Statement) of how the findings of the SEA were incorporated into the SMP</li> </ul>
<b>Stage E: Monitoring Implementation of the Plan:</b> <ul style="list-style-type: none"> <li>➤ Develop aims and methods for monitoring</li> <li>➤ Respond to adverse effects</li> </ul>

#### 1.4.3 *Focus of the SEA*

The focus of this SEA is to strategically assess how each of the four key policies which could be applied along the SMP area, over three timeframes, would affect the coastal environment and to identify options or solutions for minimising or avoiding any significant negative effects and maximising the benefits.

#### 1.4.4 *Study Area*

The area covered by this SEA includes the coastline from Kelling to Lowestoft Ness along East Anglian Coastline.

#### 1.4.5 *SEA Topics*

The environmental topics covered as part of the assessment are set out in Chapter 4. It should be noted that this SEA does not include socio-economic impacts. In accordance with the SEA Directive the SEA has considered 'population' and 'human health' issues but only in terms of the effects that the different policy options are likely to have on the main coastal activities and how they interact with each other and the environment.

A full assessment of the potential social and economic effects of the SMP would require a detailed understanding of how the different coastal user groups support local communities in terms of employment and revenue as well their contribution to England's national economy. Whilst it is fully acknowledged that it is important to have a full understanding of the wider impacts of the different marine activities on the economy and local communities in terms of the SEA, the ultimate focus of this SEA is on the 'environment'.

A separate socio-economic assessment or more detailed strategies should be carried out in order to assess the detailed implications of implementing the SMP policy options on this area and develop appropriate social and economic mitigation.

#### 1.4.6 *SEA Objectives of the SMP*

Taking account of the aims of the SMP, the main objectives of this SEA are:

1. To assess how the SMP policy options would impact on the SEA topics identified; and
2. To assess 'cumulatively' how the implementation of the four main policies along the SMP area could affect the environment.

#### 1.4.7 *SEA Activities to Date*

Although an SEA was conducted as part of the 2006 SMP, alongside the task of providing 'unified text' AECOM has been commissioned to undertake an SEA for submission as a separate accompanying report. The aim of this SEA is to assist in the assessment and refinement of SMP preferred policy options. Alongside the development of the SEA an Appropriate Assessment under the Habitats Directive and a retrospective assessment against the Water Framework Directive have been undertaken. The development of the three documents will happen in unison and each will inform the other in their development thereby avoiding a duplication of effort.

As part of stage A of the SEA process, a scoping exercise would usually be undertaken to identify the key issues that would form the focus of the detailed assessment stage. It has been assumed, and agreed with the client and key stakeholders, that the key issues have already



been identified and included in the 2006 SMP and that no further scoping work will be undertaken. However the baseline information will be updated where necessary.

The SEA of the 2006 SMP was integrated within the SMP report itself and various appendices. The information contained within these documents has been used as the basis of this SEA and included and updated where appropriate within this Environmental Report (ER). The following lists the documents produced as part of the 2006 SMP that have been used to inform this SEA.

- Appendix B: Stakeholder Engagement.
- Appendix C: Baseline Process Understanding
- Appendix D: Thematic Studies
- Appendix E: Issues and Objective Evaluation
- Appendix F: Policy Development and Appraisal
- Appendix G: Preferred Policy

These documents have been presented within Appendix 2.1 to 2.6 of this Environmental Report (ER).

#### 1.4.8 *The use of existing information from the 2006 SMP within the SEA*

##### 1.4.8.1 SEA stage A

The 2006 SMP thus included extensive data gathering, including baseline information presented in the 'Thematic Studies' and 'Baseline Process Understanding' documents. This information has been included in Appendix 2.2 and 2.3 of this ER but these documents have not been updated as part of this study.

Information from both of these documents has been abstracted and updated where necessary to inform the baseline conditions of this SEA. The baseline conditions have been presented in Chapter 6.

After the publication of the first review in 2006 extensive stakeholder consultation was carried out in developing the key issues that are within each of the policy units. The 'Stakeholder Engagement' document is presented in Appendix 2.1 of this ER.

From this detailed information key features within each of the policy units were identified, objectives developed for each of the features and then ranked accordingly in terms of their importance. This information is presented in the 'Issues and Objectives Evaluation' document which is presented in Appendix 2.4 of this ER.

The key issues that were identified as part of the 'Issues and Objectives Evaluation' report have been presented in Chapter 7 of this ER.

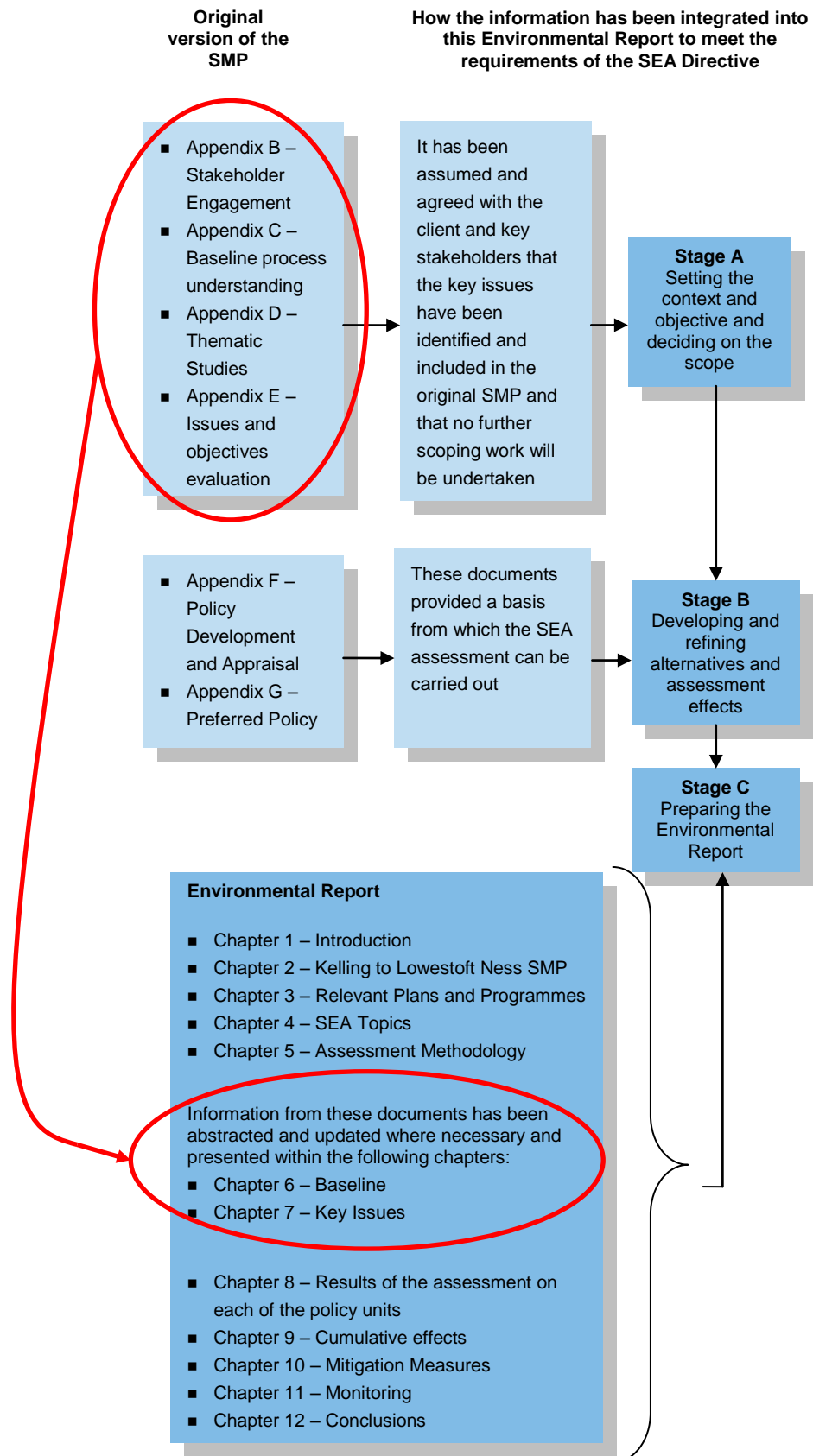
The above constitutes stage A of the SEA process as illustrated on Figure B below.

##### 1.4.8.2 SEA Stage B

The 'Policy and Appraisal' document, describes the process that was undertaken in identifying the preferred policies for each of the policy units. This document has been presented in Appendix 2.5 of this ER. The preferred policies were then assessed and presented within the 'Preferred Policy' document contained within Appendix 2.6 of this ER. This document takes the key features within each policy unit and has identified where these features will be lost under two scenarios, one for no active intervention at all three timeframes and the second for the use of the preferred policy options (described in Chapter 2) at each of the timeframes. Information from both of these documents has been abstracted and used as the basis of this assessment, a methodology of which is presented in Chapter 5 of this ER with the results of the assessment presented in Chapter 8. Detailed assessment matrixes are presented within Appendix 1.

The above constitutes as the basis for Stage B of the SEA as illustrated on Figure B below.

Figure B: The use of the information contained within the 2006 SMP within this SEA and ER



## **1.5 Habitat Regulations Assessment**

A HRA has been undertaken alongside the SEA to determine if any of the preferred policy aims will result in a likely significant effect on any Natura 2000 or Ramsar site. This has assessed the policy aims in terms of the potential for impact on any of the interest features or any of the conservation objectives of the Natura 2000 or Ramsar sites. To avoid duplication of effort the SEA will not assess the impact of the policy aims on the Natura 2000 sites in the same level of detail, however it will identify where potential for effect exists and draw on the conclusions of the HRA within the assessment where appropriate.

## **1.6 Retrospective Water Framework Directive Assessment**

The SMP has also been assessed retrospectively in order to determine whether the policies that the plan promotes might affect the ecological status of one or more of the relevant WFD water bodies within the plan area. The status would be deemed to be affected under the WFD if a SMP policy would cause a deterioration in the WFD status class of one or more of the WFD parameters at the level of the water body, or if it would prevent the water body from achieving its WFD objectives.

In line with the aims of the WFD, the assessment focused on identifying possible non-temporary detrimental effects at water body level rather than short term or local effects. For example, the permanent changes in down drift rates of erosion by changes in accretion that could result from any construction of new defences has been considered within the assessment but short term temporary impacts that may occur during construction work have not been considered by this assessment.

To avoid the duplication of effort the assessment will inform any long term impacts on water quality identified within the Environmental Report, however the SEA will not present any impacts in the level of detail presented in the WFD report. The SEA will also highlight where there is the potential for construction impacts and impacts from the erosion of contaminated land which has not been presented in the WFD report.

# 2 Kelling to Lowestoft Ness Shoreline Management Plan

## 2.1 Introduction

The Shoreline Management Plan is a non-statutory plan which is produced by Coastal groups that are made up of maritime Local Authorities and other bodies with coastal defence responsibilities or interests.

A SMP sets high level approaches for the future in terms of erosion and flood risk along the shoreline. However, it does not set policy for anything other than coastal defence management.

The Plan considers objectives, policy setting and management requirements for three main timeframes:

- 'From present day' – 0-20 years
- 'Medium term' – 20-50 years
- 'Long term' 50-100 years

### 2.1.1 *Kelling to Lowestoft Ness SMP*

The original SMP for Kelling Hard to Lowestoft Ness was completed in 1996. Since that time many lessons have been learned and reviews funded by Defra (2000, 2005) have examined the strengths and weaknesses of various plans and revised guidance has been issued. One significant issue is the inappropriateness of certain policies which, when tested in more detail with a view to being implemented, may be found to be unacceptable or impossible to justify. It is therefore important that the SMP must be realistic given known legislation and constraints, and not promise what cannot be delivered. There is no value in a long-term plan which has policies that are driven by short-term politics and cannot be justified once implementation is considered several years in the future. Equally, whilst selection of the Plan has considered the affordability of each policy, its adoption by the authorities involved does not represent a commitment to fund its implementation. Ultimately, the economic worth of policy implementation must be considered in the context of budgetary constraints (whether private or government funding), and it cannot be guaranteed that budgets will be available for all policies.

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

The plan has been updated from the first revision taking into account new information and knowledge gained in the interim period. This latest version of the plan has taken account of the following:

- Latest studies and modelling undertaken since the last SMP (e.g. the Southern North Sea Sediment Transport Study, Winterton Coastal Habitat Management Plan (CHaMP) and Futurecoast) the results of which have informed the development of Baseline Process Understanding Appendix C, and Thematic Studies Appendix D which are presented in Appendix 2.2 and 2.3 respectively of this report;
- Issues identified by most recent defence planning (i.e 6 coastal defence strategy plans which have now been produced to cover most of the SMP area between Cromer and Lowestoft);
- Changes in EU legislation (e.g. the EU Directives); and
- Changes in national flood and coastal defence planning requirements (e.g. the need to consider 100 year timescales in future planning, modifications to economic evaluation criteria etc).

## 2.2 Objectives of the Kelling to Lowestoft Ness Shoreline Management Plan

The objectives of the Kelling to Lowestoft Ness SMP are as follows:

- to define, in general terms, the risks to people and the developed, natural and historic environment, within the area covered by this SMP, over the next century;
- to identify sustainable policies for managing those risks;
- to identify the consequences of implementing these policies;
- to set out procedures for monitoring the effectiveness of the SMP policies;
- to inform others so that future land use and development of the shoreline can take due account of the risks and SMP policies; and
- to comply with international and national nature conservation legislation and biodiversity obligations.

## 2.3 SMP Policy options

The generic shoreline management policy options considered within the SMP are those defined by Defra, which are:

- **Hold the existing defence line** by maintaining or changing the standard of protection. This policy should 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 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** 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**, where there is no investment in coastal defences or operations.

## 2.4 SMP Policy Units

The Kelling to Lowestoft Ness SMP constitutes SMP 6 in England. Within this unit the coastlines have been divided up into a further 24 policy units these are listed below and have been illustrated on Figures 1.1 to 1.4 in Volume 3 of this SEA.

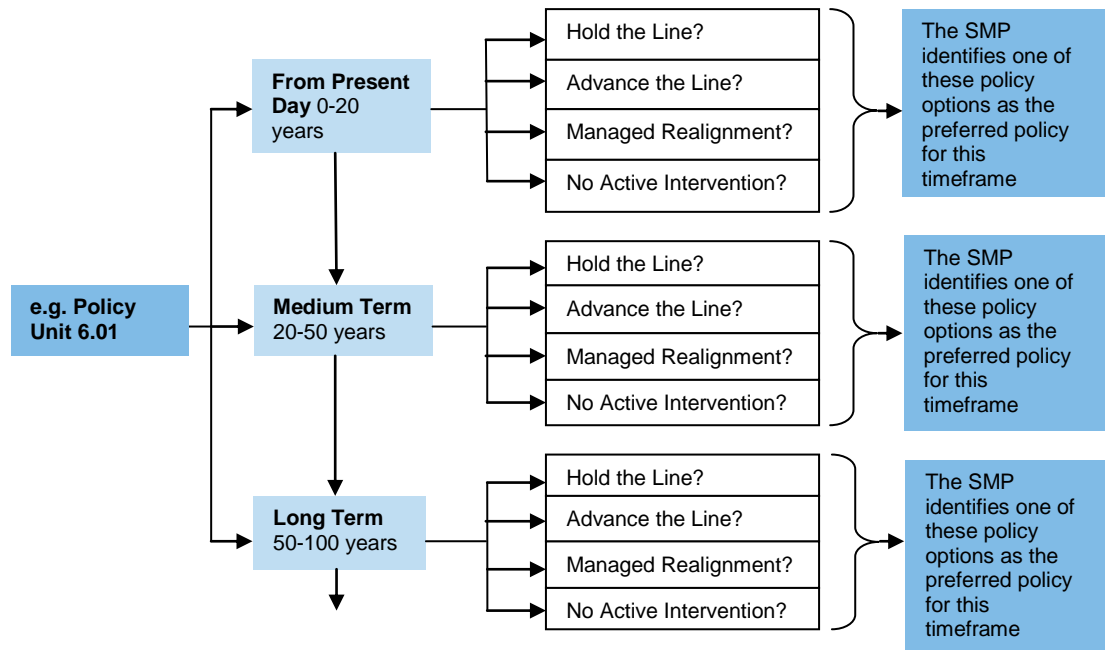
- |   |   |
|---|---|
| ■ 6.01 – Kelling Hard to Sheringham       | ■ 6.13 – Eccles to Winterton Beach Road |
| ■ 6.02 – Sheringham                       | ■ 6.14 – Winterton to Scratby           |
| ■ 6.03 – Sheringham to Cromer             | ■ 6.15 – California to Caister-on-Sea   |
| ■ 6.04 – Cromer                           | ■ 6.16 – Caister-on-Sea                 |
| ■ 6.05 – Cromer to Overstrand             | ■ 6.17 – Great Yarmouth                 |
| ■ 6.06 – Overstrand                       | ■ 6.18 – Gorleston                      |
| ■ 6.07 – Overstrand to Mundesley          | ■ 6.19 – Gorleston to Hopton            |
| ■ 6.08 – Mundesley                        | ■ 6.20 – Hopton                         |
| ■ 6.09 – Mundesley to Bacton Gas Terminal | ■ 6.21 – Hopton to Corton               |
| ■ 6.10 – Bacton Gas Terminal              | ■ 6.22 – Corton                         |

- 6.11 – Bacton, Walcott and Ostend
- 6.12 – Ostend to Eccles

- 6.23 – Corton to Lowestoft
- 6.24 – Lowestoft North (to Ness Point)

The SMP has identified one of the four policy options listed in Section 2.3 for each of the 24 policy units during each of the three timeframes listed in Section 2.1, this has been illustrated on Figure C below.

**Figure C: Selection of policy options for each of the Policy Units at the three timeframes**



Each of the policies which have been identified for each of the policy units are policy options. Where the policies have been changed from hold the line or managed realignment from the original SMP 1 the SMP 1 policy will continue to be implemented in the short term, until the SMP2 policy options have been assessed as part of a more detailed coastal strategy. This more detailed strategy will look at social mitigation, economic costs and benefits and the environmental impacts in more detail as well as a greater understanding of the coastal processes. If these strategies confirm the deliverability of the SMP2 policy options then it will be implemented. If further investigation identifies that the policy option is not deliverable then the original SMP1 policy will remain in place until the next SMP revision.

Where the policy in the original SMP 1 was for no active intervention and this policy is the same for SMP2 no further strategies will necessarily be undertaken; although such areas may fall within the section of coast considered within one or more coastal strategies.

Other policies and plans will take the SMP2 into consideration when making planning decisions. When such plans are developed they will need to assume that the SMP2 policy options are being implemented, regardless of the outcome of and subsequent detailed strategies. This approach will allow for adaptation to begin.

# 3 Relevant Plans and Programmes

## 3.1 Introduction

As part of the SEA it is necessary to consider the relationship between the proposed plan and other relevant plans and programmes and the relevant environmental protection objectives which need to be taken into account. In the case of the SMP the legal and regulatory framework comprises a range of European, UK and domestic regulatory instruments and obligations. There are also a number of UK and domestic strategies that need to be taken into account in the development of the SMP.

### 3.1.1 *International*

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

The current legal instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic. Work under the Convention is managed by the OSPAR Commission. It aims to conserve marine ecosystems and safeguard human health in the North-East Atlantic by preventing and eliminating pollution; by protecting the marine environment from the adverse effects of human activities; and by contributing to the sustainable use of the seas.

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

The convention aims to encourage the identification, protection and preservation of earth's cultural and natural heritage, recognising that nature and culture are complementary and that cultural identity is strongly related to the natural environment in which it develops. It is not intended to protect all properties of great interest, but rather a select list of the most outstanding of these from an international viewpoint.

#### *The Convention on Wetlands of International Importance*

Ramsar convention is an international treaty for the conservation and utilisation of wetlands.

#### *The Convention on Biological Diversity*

Effectively halt the loss of biodiversity so as to secure the continuity of its beneficial uses through the conservation and sustainable use of its components and the fair and equitable sharing of benefits arising from the use of genetic resources.

#### *Convention on Migratory Species*

Also known as CMS or Bonn Convention aims to conserve terrestrial, marine and avian migratory species throughout their range. They aim to conserve populations of European Bats; Cetaceans of the Mediterranean Sea, Black Sea and Contiguous Atlantic Sea; Small Cetaceans of the Baltic and North Seas; Seals in the Wadden Sea; African-Eurasian Migratory Waterbirds; Albatross and Petrels; and Gorillas and their Habitats.

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

International Treaty formed to consider what can be done to reduce global warming and to cope with whatever temperature increases are inevitable. More recently, a number of nations approved an addition to the treaty: the Kyoto Protocol. It sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas emissions.

## 3.1.2

*European**Water Framework Directive (2000/60/EC)*

Legal framework for the protection, improvement and sustainable use of surface waters, transitional waters and coastal waters (up to 1nm of territorial waters) and groundwater across Europe. Main aims of the WFD include:

- Prevent deterioration and enhance status of aquatic ecosystems, including groundwater
- Promote sustainable water use
- Reduce pollution
- Contribute to the mitigation of floods and droughts

*Shellfish Waters Directive (79/923/EC)*

Where necessary, improve the quality of waters where shellfish grow and to contribute to the high quality of directly edible shellfish products. The Directive prescribes the minimum quality criteria which must be met by shellfish waters, and guideline values which member states must endeavour to observe.

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

To protect public health and the environment from faecal pollution at bathing waters. Member states are required to identify popular bathing areas and to monitor water quality at these bathing waters throughout the bathing season, running from mid May to the end of September in England.

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

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. The Directive applies to the UK and to its overseas territory of Gibraltar.

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

To ensure biodiversity through the conservation of natural habitats and of wild fauna and flora in the territories of the Member States. Pursuant to this Directive measures shall be designed and undertaken in order to maintain or restore, as the case may be, natural habitats and species of wild flora and fauna.

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

The directive establishes a framework for environmental liability based on the “polluter pays” principle, with a view to preventing and remedying environmental damage; to the aquatic environment, species or natural habitats and the contamination of land.

## 3.1.3

*National**Planning Policy Statement (PPS) 25: Development and Flood Risk*

The aims of planning policy on development and flood risk are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy options to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.

In areas at risk of river or sea flooding, preference should be given to locating new development in Flood Zone 1. If there is no reasonably available site in Flood Zone 1, the flood vulnerability of the proposed development can be taken into account in locating development in Flood Zone 2 and then Flood zone 3. Within each Flood Zone new development should be directed to sites at the lowest probability of flooding from all sources.

Zone 1 (Low Probability)



- This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).
- All uses of land are appropriate in this zone

#### Zone 2 (Medium Probability)

- This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.
- The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure are appropriate in this zone.

#### Zone 3a (High Probability)

- This zone comprises land assessed as having a 1 in 100 or greater annual probability of flooding from the sea (>0.5%) in any year.
- The water-compatible and less vulnerable uses of land are appropriate in this zone.
- The highly vulnerable uses should not be permitted in this zone.
- Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in time of flood.

#### Zone 3b (The Functional Floodplain)

- This zone comprises land where water has to flow or be stored in times of flood. It has an annual probability of 1 in 20 (5%) or greater in any year or is designated to flood in an extreme (0.1%) flood.
- Only the water-compatible uses and the essential infrastructure that has to be there should be permitted in this zone. It should be designed and constructed to:
  - Remain operational and safe for users in times of flood;
  - Result in no net loss of floodplain storage;
  - Not impede water flows; and
  - Not increase flood risk elsewhere.

### 3.1.4

#### *Regional*

##### *East of England Plan – The Revision to the Regional Spatial Strategy for the East of England. May 2008*

Provides a long term strategy for the sustainable development of the region supporting urban renaissance, economic growth and the housing needs of all sectors of the community, whilst protecting the environment.

### 3.1.5

#### *Local*

##### *North Norfolk Local Development Framework Core Strategy (Incorporating Development control Policies) September 2008*

The Core Strategy outlines the vision and objective for development in North Norfolk up to 2021. It also contains the district wide development control policies for North Norfolk that will inform future planning decisions, covering the following topics:

- Affordable housing;
- Housing density;
- Tourism;
- Flood Risk;
- Coastal erosion;
- Climate change;
- Redundant defence establishments; and
- Protecting the natural and built environment.

### Great Yarmouth Borough Council Core Strategy

Sets out the overall vision and planning strategy for the Borough to 2021 and to 2025 for housing. Subsequent Development Plan Documents and Supplementary Planning Documents will have to conform to the core strategy.

### Waveney District Council Core Strategy Development Plan Document 'The Approach to Future Development in Waveney to 2021' Adopted January 2009

This document will form part of the Waveney Local Development Framework (LDF) which is currently under consultation.

- Waveney is identified as a priority area for regeneration, with there being scope for the provision of at least 5,800 (290 per annum) additional dwellings over the period 2001 – 2021.
- The focus for development will be on previously developed land within the built-up areas, with more than 50% of housing and 60% of employment expected to be delivered on brownfield (previously developed) sites.
- An integral part of the strategy will be to protect and enhance local distinctiveness and the green infrastructure of the District, such as open space and biodiversity.
- The strategy for the coast is to adopt an integrated approach to the regeneration of coastal towns and communities covering economic, social and environmental issues.
- There is recognition of the important role of market towns and larger villages in providing employment and services to their rural hinterlands.

### The Broads Authority Local Development Framework Core Strategy DPD 2007-2021 Adopted 28 September 2007

The Core Strategy was the first Development Plan Document to be prepared by the Authority as part of its Local Development Framework. It is a key document that sets out the vision for the Broads until 2021, including environmental, social and economic objectives and primary policies for achieving that vision.

## 3.2

### Implications of the relevant plans and programmes for the SMP

Table 3.1 below details the relevant plans and programmes that are described above and details whether or not the SMP would have any implications either positive or negative on these plans and programmes.

✖	Potential negative interaction
✓	Potential positive interaction

**Table 3.1: Implications of the SMP on the relevant plans and programmes**

Relevant Plans and Programmes	Potential implication of the SMP ✖ / ✓	Justification
<b>International</b>		
The Convention for the Protection of the Marine Environment on the North-East Atlantic	N/A	The SMP is a coastal plan and is therefore unlikely to impact on the marine environment
The Convention Concerning the Protection of the World Cultural and Natural Heritage.	✖	If any of the policy options result in the loss of any heritage sites this could oppose this convention.
The Conservation on Wetlands of International Importance	✖	If any of the policy options result in saline intrusion into Ramsar sites this could oppose this convention.
The Convention on Biological Diversity	✖	If any of the SMP policy options result in the loss of

Relevant Plans and Programmes	Potential implication of the SMP ✖ / ✓	Justification
		protected habitats this may oppose the aims of this convention.
Convention on Migratory Species	✖	If any of the SMP policies result in the loss of habitats for migratory species this may oppose the aims of this convention.
United Nations Framework Convention on Climate Change	N/A	It is unlikely that the effects of the SMP will impact on this convention.
<b>European</b>		
Water Framework Directive (2000/60/EC)	✖	If any of the policy options result in the any loss of or damage to infrastructure such as sewers, pumping stations or any landfills to erode without first being remediated this could result in a temporary deterioration in bathing water quality opposing this directive.
Shellfish Waters Directive (2000/60/EC)	N/A	It is unlikely that the effects of the SMP will impact on this convention.
Council Directive 76/160/EEC on the Quality of Bathing Water	✖	If any of the policy options result in the any loss of or damage to infrastructure such as sewers, pumping stations or any landfills to erode without first being remediated this could result in a temporary deterioration in bathing water quality opposing this directive.
Council Directive 79/409/EEC on conservation of Wild Birds	✖	If any of the policy options result in the loss of habitats for wild birds this would oppose the aims of this directive.
Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora	✖	If any of the policy options result in the loss of habitat for fauna and flora this would oppose this directive.
Council Directive on Environmental Liability	N/A	It is unlikely that the effects of the SMP will impact on this Directive.
<b>National</b>		
Planning Policy Statement (PPS) 25: Development and Flood Risk	✓	If any of the policy options deter any new development from within areas of flood risk this will be consistent with the aims of PPS25.
<b>Regional</b>		
East of England Plan – The Revision to the Regional Spatial Strategy for the East of England May 2008	✓	The policy options of the SMP should be taken account of within any revisions to regional plans.
<b>Local</b>		
North Norfolk Local Development Framework Core Strategy (Incorporating Development Control Policies) September 2008	✓	The policy options of the SMP should be taken account of within any revisions to local plans and local planning policy.
Great Yarmouth Borough Council Core Strategy	✓	The policy options of the SMP should be taken account of within any revisions to local plans and local planning policy.
Waveney District Council Core Strategy Development Plan Document 'The Approach	✓	The policy options of the SMP should be taken account of within any revisions to local plans and

Relevant Plans and Programmes	Potential implication of the SMP ✖ / ✓	Justification
to Future Development in Waveney to 2021' Adopted January 2009.		local planning policy.
The Broads Authority Local Development Framework Core Strategy DPD 2007-2021 Adopted 28 <sup>th</sup> September.	✓	The policy options of the SMP should be taken account of within any revisions to local plans and local planning policy.

Where the SMP has been identified to have negative implications on any of the relevant plans and programmes these have been carried forward into the SEA assessment. Table 3.2 below documents how this has been achieved.

**Table 3.2: How the negative interactions with relevant plans and programmes have been taken into account within the SEA**

Relevant Plans and Programmes	How the negative interactions have been taken into account within the SEA
<b>International</b>	
The Convention Concerning the Protection of the World Cultural and Natural Heritage.	The SEA has assessed where the policy options will result in the loss of any heritage sites and mitigation measures presented in Chapter 10. This will allow any adverse impacts on heritage to be mitigated prior to the implementation of the plan.
The Conservation on Wetlands of International Importance	The SEA has assessed where the policy options will have an impact in protected sites and species including Ramsar sites. Where any adverse impacts have been identified as a result of implementing the plan the SEA has set out mitigation measures and monitoring requirements. However the Habitats Regulations Assessment should be referred to for greater detail on impacts and avoidance measures for all the Natura 2000 sites (including Ramsars) which the SMP could have a likely significant effect.
The Convention on Biological Diversity	The SEA has where the policy options will have an impact both negative and positive on protected sites and species as well as ecosystems and biological diversity. Mitigation measures are presented in Chapter 10 to avoid and minimise and predicted adverse effects, however, the HRA should be referred to for any impacts that are predicted on any Natura 2000 site.
Convention on Migratory Species	The SEA has assessed the where the policy options could have an impact on habitat loss which could be used for migratory species in particular Special Protection Areas (SPAs). Where adverse impacts have been identified mitigation measures have been presented. However where there is the potential for habitat loss for migratory species within SPAs the HRA should be referred to.
Water Framework Directive (2000/60/EC)	The SEA has assessed where the policy options could result in a negative impact on water quality as a result of the potential for saline intrusion, erosion of infrastructure un mitigated in particular sewage infrastructure and the potential for the exposure on historic landfills. In addition a separate assessment / report has been produced which assesses the compliance of the plan with the WFD.
Council Directive 76/160/EEC on the Quality of Bathing Water	The SEA has assessed the potential for the implementation of the policy options to have an impact on human health which includes bathing water quality. In addition the assessment of water quality effects is directly related to impacts on bathing water quality. Mitigation measures have been set out in chapter 10 to mitigate potential impacts on water quality which in turn will mitigate any impacts on bathing water quality.
Council Directive 79/409/EEC on	The SEA has assessed the potential for the policy options to impact on the protected sites and species which includes SPAs. Where there is the potential

Relevant Plans and Programmes	How the negative interactions have been taken into account within the SEA
conservation of Wild Birds	for an impact mitigation measures have been presented. However the HRA should be referred to for greater detail on the impacts on Natura 2000 sites and any avoidance measures.
Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora	The SEA has where the policy options will have an impact both negative and positive on protected sites and species as well as ecosystems and biological diversity. Mitigation measures are presented in Chapter 10 to avoid and minimise and predicted adverse effects, however, the HRA should be referred to for any impacts that are predicted on any of the Natura 2000 site.

# 4 SEA Topics

## 4.1 Introduction

This chapter sets out the topics that have been covered by the SEA. The list is derived from the SEA Directive and refined to make it relevant to the coastal environment. The SEA topics were identified through the authors' knowledge of the SEA process, the requirements of the Directive, and an understanding of the SMP.

## 4.2 SEA Topics

Table 4.1 below identifies the key areas (receptors) under the SEA directive topics (subject matter) that this SEA will consider in respect of the preferred and alternative policies of the Kelling to Lowestoft Ness SMP. Table 4.1 also presents a list of typical important factors under the key areas for consideration. These factors are only a guideline and may not all be relevant to the Kelling to Lowestoft Ness coastline. For more detailed information on key features within in each of the policy units please refer to Chapter 7 Tables 7.1 to 7.24.

**Table 4.1: SEA Topics Covered in the SEA of the SMP**

SEA Directive Topics	Key Areas for Consideration	Typical Important Factors
<b>Biodiversity, Flora and Fauna</b>	Protected sites and species	<ul style="list-style-type: none"> <li>■ Natura 2000 Sites (SPAs and SACs) and Annex 2 species</li> <li>■ Biodiversity Action Plan species and habitats</li> <li>■ Sites of Special Scientific Interest (SSSIs)</li> <li>■ Marine Protected Areas (MPAs)</li> <li>■ Local / County Wildlife Sites (CWS)</li> </ul>
	Ecosystems and biological diversity	<ul style="list-style-type: none"> <li>■ Sea birds</li> <li>■ Ecosystems (Components and whole)</li> </ul>
<b>Soil</b>	Sediment, geology, geomorphology (coastal processes)	<ul style="list-style-type: none"> <li>■ Sediment, geology, geomorphology (coastal processes)</li> </ul>
<b>Water</b>	Water quality	<ul style="list-style-type: none"> <li>■ Marine discharges</li> <li>■ Bathing Waters/Shellfish Waters Directive</li> <li>■ Water Framework Directive (WFD) targets</li> <li>■ Diffuse pollution</li> </ul>
	Coastal Flooding	<ul style="list-style-type: none"> <li>■ Coastal Flooding</li> </ul>
<b>Air</b>	Dust	<ul style="list-style-type: none"> <li>■ Dust</li> </ul>
<b>Noise</b>	Noise	<ul style="list-style-type: none"> <li>■ Noise and Vibration.</li> </ul>
<b>Climatic Factors</b>	Reducing CO2 Emissions	<ul style="list-style-type: none"> <li>■ CO<sub>2</sub> emissions from coastal activities</li> <li>■ Renewable energy</li> </ul>

SEA Directive Topics	Key Areas for Consideration	Typical Important Factors
	Adapting to a change in climate	<ul style="list-style-type: none"> <li>■ Increased 'storminess' and changes in weather patterns</li> <li>■ Storm surges</li> <li>■ Adapting to sea level rise</li> <li>■ Coastal Flooding</li> </ul>
<b>Archaeology and Heritage</b>	Historic Environment and Archaeology	<ul style="list-style-type: none"> <li>■ World Heritage Sites</li> <li>■ Historic Parks and Gardens</li> <li>■ Registered Battlefields</li> <li>■ Ancient Woodland</li> <li>■ Scheduled Monuments</li> <li>■ Listed buildings</li> <li>■ Conservation areas</li> </ul>
<b>Landscape</b>	Natural Landscape seascape	<ul style="list-style-type: none"> <li>■ Landscape and seascape character and capacity</li> <li>■ National Parks</li> <li>■ Character Areas</li> <li>■ Natural Areas</li> <li>■ Areas of local importance (local designations)</li> </ul>
	Built landscape and townscape	<ul style="list-style-type: none"> <li>■ Character Areas</li> <li>■ Dereliction</li> </ul>
<b>Material Assets</b>	Coastal material assets	<ul style="list-style-type: none"> <li>■ Coastal infrastructure (including ports, harbours and marinas)</li> <li>■ Property</li> <li>■ Access</li> <li>■ Coastal defences</li> </ul>
<b>Population</b>	Coastal activities / industries	<ul style="list-style-type: none"> <li>■ Fishing and mariculture</li> <li>■ Recreation and tourism</li> <li>■ Ports and harbours and marinas</li> <li>■ Agricultural land</li> <li>■ Residential property</li> </ul>
<b>Human health</b>	Physical and mental wellbeing	<ul style="list-style-type: none"> <li>■ Bathing beaches</li> <li>■ Navigational safety (recreational/commercial)</li> <li>■ Food quality (fish and shellfish)</li> <li>■ Bathing waters/shellfish waters</li> <li>■ Stress and anxiety</li> </ul>

The preferred policies will be assessed against the key areas for consideration taking into account the important features within them. The methodology for this assessment is presented in Chapter 5.

It is predicted that the SMP will only have temporary impacts on air and noise associated with the construction of sea defences. Where there is the potential for any temporary impacts these have been highlighted in the results section, however these will be assessed in more detail at project level, therefore no baseline information for these topic areas has been presented within this report.

# 5 Assessment Methodology

## 5.1 Introduction

This chapter sets out the method used to assess the effects of the SMP on the environment.

This ER brings together and builds upon the previous assessments and includes details of impact prediction, evaluation, mitigation and monitoring the environmental effects of the SMP.

## 5.2 Methodology

The assessment process comprises a series of four stages, the output from each informing the following stage as set out below. These stages include:

1. Establishing the baseline
2. Assessing the effects of the policies on the environment
3. Assessing the cumulative and in-combination effects of the SMP
4. Identification of appropriate mitigation measures to avoid, reduce or offset any adverse effects of the SMP (for both policy units and cumulative effects) and opportunities for improving the effectiveness of Plan.

### 5.2.1 *Establishing the baseline and identifying the key issues*

A summary of the relevant baseline data from the 'Thematic Studies' and 'Baseline Process Understanding' documents prepared as part of the 2006 SMP which has been updated where necessary is presented in Chapter 6 of this Environmental Report.

From analysis of the baseline data, key features within each of the policy units have been identified and presented in the 'Issues and Objectives Evaluation' document that was prepared as part of the 2006 SMP. The key features and issues identified by this document have been extracted and presented in Chapter 7 of this Environmental Report.

Unlike the Issues and Objectives Evaluation document which ranks features by level of importance this SEA does not involve any weighting of the SEA topics and each topic is considered in terms of its own value. The main purpose of the SEA is to provide guidance and advice on where potentially significant adverse effects could occur and how these can be avoided or reduced. It is not the roles of the SEA to determine which of the topics assessed are of greater or lesser value to the shoreline than others.

### 5.2.2 *Assessing the effects of the SMP policies one the policy units*

The main focus of the SEA process is to assess, at a strategic level, the potential effects of a plan / programme on the environment. The SEA Directive and associated regulations identify a number of components / topics for which impacts can be assessed.

It is proposed that, due to the complexity and the nature of the shoreline and coastal environment that it would be more appropriate to focus the assessment on the SEA topics rather than developing SEA objectives. Although the use of SEA objectives is not a statutory requirement of the SEA Directive or SEA Regulations (England) 2004, it is recognised as standard practice in the SEA process as a mechanism for identifying all 'possible' effects that



need to be addressed in the assessment. However, they do not always offer the flexibility required when assessing complex plans or environments.

SEA is an iterative process which can be used to inform the development of plans and programmes. The methodology used for this SEA has assisted in the development of the final policies to be included in the SMP.

### 5.3

#### Evaluation Criteria

The evaluation criteria used in the assessment of the SMP reflects the strategic high level nature of this SEA.

The general approach to SEA is to identify potentially significant adverse effects. Significance is a measure of the magnitude of a potential effect compared to/in relation to the sensitivity or importance of the receptor e.g. the SEA topics. An accurate and robust determination of effect magnitude or sensitivity of a receptor requires a certain level of qualification or quantification. This is generally based on the information contained within the plan, programme or strategy being assessed and the information contained within the baseline review.

Due to the sensitivity of the issues which surround the plan it was not considered appropriate to try and qualify the assessment in any great detail. This included any differentiation between the level of importance of the features identified as high, medium or low. Instead, each feature should be considered in its own right, independently of any others and are therefore based on the criteria set out in Table 5.1 below.

Table 5.1 below sets out the evaluation criteria that has been used to assess the impact of the preferred policies for each of the policy units on the SEA topics identified in Chapter 4 at each of the three timeframes.

**Table 5.1: Evaluation Criteria**

Potential Effect		Evaluation Criteria
<b>Significant Adverse</b>	<b>xx</b>	<p>The precise measure for <b>significant adverse effect</b> will vary across the different SEA topics. However, in general, the key factors influencing the potential for a significant adverse effect to occur are likely to include:</p> <ul style="list-style-type: none"> <li>▪ Permanent, long term or irreversible change in baseline conditions e.g. reduction in quality of baseline environment or effect on baseline features (receptors)</li> <li>▪ Direct and indirect effect on baseline features of international or European importance e.g. habitats, species and sites designated under the EU Habitats or Birds Directives,</li> <li>▪ Direct effect on baseline features of national importance (e.g. habitats or species of national value/importance)</li> </ul> <p>It should be noted that each SEA topic, and the baseline environment/features (receptors) associated with that topic, will need to be considered on a case by case basis. There is potential that the criteria listed above will be subject to modification during the assessment to reflect specific characteristics of the baseline environment along the North Norfolk coast. However, any modifications will be reflective of the main principles of an assessment of <b>significant adverse effect</b> listed above.</p>
<b>Negative</b>	<b>x</b>	<p>As above, the measure for <b>negative effect</b> will vary across the different SEA topics. However, in general, the key factors influencing the potential for a negative effect to occur are likely to include:</p> <ul style="list-style-type: none"> <li>▪ Temporary, short term or reversible change in baseline conditions e.g. reduction in quality of baseline environment or effect on baseline features (receptors)</li> <li>▪ Indirect effect on baseline features of national importance (e.g. habitats or species of national value/importance)</li> <li>▪ Direct effect on baseline features that are not designated under international, European or national legislation</li> </ul>
<b>No impact</b>	<b>=</b>	The will be no interaction between the policy along the North Norfolk coast and the baseline environment / feature.

Potential Effect		Evaluation Criteria
No change from baseline	~	There will be no change in baseline environment/features resulting from the implementation of the policies.
Slight Beneficial	✓	The implementation of the policies along the North Norfolk coast will have a slight positive effect on the baseline environment/features.
Beneficial	✓✓	The implementation of the policies along the North Norfolk coast will have a positive effect on the baseline environment/features.

## 5.4

### Cumulative Effects

The assessment has addressed the impacts of the SMP on the SEA topics for each of the individual policy units. However the impact of the SMP on the shoreline should also be considered as a whole in order to observe what the overarching impact of the SMP would be. The cumulative effects on each of the topic areas, within the SMP have been presented in Chapter 9.

Cumulative effects with other plans and programmes have been discussed in Chapter 3. No negative interactions have been identified with any of the national, regional or local plans therefore have not been considered any further. Where the SMP has been identified to have a negative interaction with any of the international conventions or European Directives these have been taken into account within the assessment and within the proposed mitigation and monitoring measures.

## 5.5

### Mitigation Measures

Where significant adverse and negative impacts have been identified mitigation measures have been produced to reduce the effect of these impacts. Mitigation measures have been presented in Chapter 10, however due to the strategic nature of this assessment it should be recognised that detailed measures are unable to be developed at this stage. Further detailed strategies would need to be carried out incorporating local knowledge in order to develop specific mitigation.

# 6 Baseline

## 6.1 Introduction

Baseline data is information, either qualitative or quantitative, that is used to describe the status of the environment and population (including human health) that may potentially be affected by the plan. Baseline information is essential to the SEA process as it is necessary to understand the current baseline e.g. status or condition of the coastal environment, to determine how it would change following the implementation of measures/policies proposed within the SMP.

It is important to note that the baseline is only a snap shot of the existing situation. It is subject to continual change, either from natural processes/change or human intervention. Therefore, when assessing how measures/policies introduced through the SMP would affect the environment, consideration must be given to how the baseline would change in the absence of the SMP. This required analysis of how the baseline has changed over time to predict how it may change in the future e.g. data trends.

Baseline data should also reflect the level of detail, subject matter and geographical scale of the Plan that is being assessed. Consequently in terms of this SEA the baseline data that has been collated is very high level and strategic, reflecting the content of the SMP.

Having reviewed the 2006 version of the SMP, and in discussion with the East Anglia Coastal Group, it was agreed that the key environmental issues had already been identified and included within the 2006 SMP and that no further scoping work would be undertaken.

Extensive consultation was undertaken in determining the scope of the 2006 SMP and SEA, and a three level approach was adopted:

- Level 1: the Client Steering Group (CSG)
- Level 2: an Extended Steering Group (ESG)
- Level 3: additional stakeholders.
- Elected Members were also consulted at the Draft SMP Stage.

The themes considered in the 2006 Strategic Environmental Assessment within the SMP included the following:

Consideration of the statutory nature conservation designations, which included:

- All candidate and fully implemented Special Areas of Conservation
- All proposed and fully implemented Special Protection Areas
- All Ramsar sites
- Sites of Special Scientific Interest (SSSIs) and Geological Conservation Review sitesb (GCRs)
- National Nature Reserves
- Consideration of non-statutory nature conservation designations, which included County Wildlife Sites and Nature Reserves
- Biodiversity Habitats and Species
- Landscape and visual factors, including Area of Outstanding Natural Beauty and Local Landscape Area designations and structure/local planning policy.
- Landscape Character Areas
- The historic environment, including Scheduled Monuments, Sites and Monuments Record entries and Historic Parks and Gardens and Historic Wrecks
- Land use, including residential, commercial, agricultural, recreation, tourism and amenity,
- The planning policy framework.

The ESG acted as a focal point for discussion and consultation throughout development of the 2006 SMP, and members of the ESG were involved in a series of workshops throughout SMP development and also consulted through written correspondence. Additional stakeholders were consulted at the start of the SMP in order to gather information and views on issues along the SMP coastline. A copy of Appendix B: Stakeholder Engagement from the 2006 SMP report is appended to provide an outline of the strategy adopted to determine the scope of the original works.

The baseline information that was compiled as part of the 2006 SMP which was published in November 2006 (Baseline Process and Understanding and Thematic Studies) is presented in Appendix 2.2 and 2.3. This section uses the information abstracted from these documents and has been updated where necessary e.g. baseline information on the WFD status of water bodies which was not available in 2006 has been included. However no alternations have been made to the supporting documents as part of this SEA.

Following adoption of the SMP, the environmental effects will be monitored and the baseline information collected for the ER provides a starting point for this monitoring. Proposals for monitoring environmental effects are set out in Chapter 11. The final monitoring framework will be presented in the Post- Adoption SEA Statement.

### 6.1.1 *Introduction to the SMP Study Area*

The SMP encompasses the stretch of the coastline between Kelling in the north and Lowestoft Ness in the south. Along this section of the coastline there are five large commercial centres, Sheringham, Cromer, Great Yarmouth, Gorleston, and Lowestoft. Between these centres there are a number of smaller towns and villages situated within agricultural land. Also located along this section of the coastline are the Broads which is Britain's largest nationally protected wetland totalling 303 sq km. The area comprises rivers, shallow lakes, marshes and fens which have been formed through the reclamation of land which began in the thirteenth century. This area is internationally important both for its conservation value and tourism and recreation attracting over two million visitors per year.

## 6.2 **Protected sites and species**

The following section identifies the protected sites and species that are located along the coastline between Kelling and Lowestoft Ness. Protected areas that are located within the Broads have also been identified. Even though they are not located along the coastline the Broads forms part of the coastal floodplain which is reliant on and artificial coastal defences.

There are a number of protected sites and species that have been identified along the SMP area which include a number of Natura 2000 sites.

Natura 2000 sites are protected across Europe due to their high value for natural habitats, species, plants and animals which are rare, endangered or vulnerable. There are two types of Natura 2000 sites, those designated as Special Areas of Conservation (SAC) which contain endangered and vulnerable natural habitats and species of plants and animals other than birds. The Second type are those designated as Special Protection Areas (SPA) which are protected as they support significant numbers of birds and for the habitats present.

### 6.2.1 *Special Areas of Conservation*

There are two SACs along the Kelling to Lowestoft Ness SMP area. These are described below in Table 6.1 including the primary reason for their designation. They have been illustrated on Figures 3.1 to 3.4 in Volume 3:

**Table 6.1: Coastal SAC sites**

<b>Name</b>	<b>Location in relation to the SMP</b>	<b>Primary reason for designation</b>
<b>Overstrand</b>	Falls almost entirely within policy unit 6.05 –	<b>Annex I habitats:</b> Vegetated sea cliffs of the Atlantic

<b>Cliffs SAC</b>	Cromer to Overstrand and a small section encompasses policy unit 6.06 – Overstrand	and Baltic Coasts
<b>Winterton-Horsey Dunes SAC</b>	Located in the southern half of policy unit 6.13 – Eccles to Winterton Beach Road and the northern part of policy unit 6.14 – Winterton	<b>Annex I habitats:</b> Atlantic decalcified fixed dunes (Calluno-Ulicetea) and humid dune slacks

### 6.2.1.1 SAC Designated Sites Located with the Broads

The Broads SAC is detailed below in Table 6.2.

**Table 6.2: SACs within the coastal floodplain**

Name	Location in relation to the SMP	Primary reason for designation
<b>The Broads SAC</b>	There are a number of different areas which are located inland between policy area 6.13 – Eccles to Winterton Beach Road and the southern extent of the SMP at Lowestoft.	<b>Annex I habitats:</b> Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation, Transition mires and quaking bogs, Calcareous fens with <i>Cladium mariscus</i> and species of the caricion davallianae, Alkaline fens and Alluvial forests with <i>Anus qlutinosa</i> and <i>Fraxinus excelsior</i> (Alno – Padion, Alnion incanae, Salicion albae)  <b>Annex II species:</b> Desmoulin's whorl snail and Fen orchid

### 6.2.1.2 Other SACs

There is one SAC which is not located along the coastline, however has the potential to be effected in the long term and beyond, so it has been considered within the SEA. This is described below in Table 6.3 and has been illustrated on Figure 3.1 within Volume 3:

**Table 6.3: Other SACs**

Name	Location in relation to the SMP	Primary reason for designation
<b>Paston Great Barn SAC</b>	Lies approximately 1km from the coast, between policy units 6.09 – Mundesley to Bacton Gas Terminal and 6.10 – Bacton Gas Terminal in the village of Paston	<b>Annex II species:</b> Barbastelle <i>Barbastella barbastellus</i> only known example of maternity roost of <i>Barbastella barbastellus</i> in a building

## 6.2.2 Special Protection Areas

There is one SPA along the coastline between Kelling to Lowestoft Ness SMP which is split between two locations. This is detailed in Table 6.4 including the reason for its designation. This site is also illustrated on Figures 4.1 to 4.3 in Volume 3.

**Table 6.4: SPAs located along the coastline between Kelling and Lowestoft Ness**

Name	Location in relation to the SMP	Primary reason for designation
<b>Great Yarmouth North Denes SPA</b>	This part of the site is located along the shoreline within the southern half of policy unit 6.13 – Eccles to Winterton Beach Road and the northern part of policy unit 6.14 – Winterton.	These sites qualify under Annex I for supporting populations of Little Tern <i>Sterna albifrons</i> during the breeding bird season.
<b>Great Yarmouth, North Denes SPA</b>	This part of the site is located within the northern half of policy unit 6.17 – Great Yarmouth	

### 6.2.2.1 SPA Designated Sites Located within the Broads

The Broads SPA is not located along the coastline, however, does fall within the coastal floodplain. The Broads SPA is made up of a number of different areas which are located inland

between policy unit 6.13 – Eccles to Winterton Beach Road and the southern extent of the SMP area at Lowestoft.

### 6.2.3 *Assessment of Natura 2000 Sites*

As part of the preparation of the unified SMP, a Habitat Regulations Assessment (HRA) is required under the European Directive 92/43/EEC (The Habitats Directive) to ascertain whether the policies are likely to have a significant adverse effect on the integrity of any European Site within the plan area or adjacent areas. A HRA is being carried out by AECOM on the impact of the proposed SMP therefore in order to avoid duplication of effort the SEA will consider whether or not there is likely to be an impact on a Natura 2000 site, however the HRA should be referred to for more detailed information on these sites.

### 6.2.4 *Ramsar designated sites*

Ramsar sites are Wetlands of International Importance designated under the Ramsar Convention. There are no Ramsar sites located along the coastline of the Kelling to Lowestoft Ness SMP. However, there are two Ramsar sites that are within the coastal floodplain area of the Broads, and therefore have been considered by this SEA. The two Ramsar sites that have been identified within this area are detailed below and presented on Figure 5.1 in Volume 3.

- The Broads Ramsar is made up of a number of different areas and is located inland between policy unit 6.13 – Eccles to Winterton Beach Road and the southern extent of the SMP at Lowestoft.
- Breydon Water Ramsar is located adjacent to the east of the town of Great Yarmouth

Ramsar sites have also been considered by the HRA therefore detailed information on these sites has also been presented within the HRA report.

### 6.2.5 *Natura 2000 sites and the Water Framework Directive (WFD)*

A large number of SACs and SPAs have been identified as wholly or partly water dependent. The draft River Basin Management Plans (RBMPs) that have been developed under the requirements of the WFD set out the status, objective and a programme of measures for each of these water dependant protected sites. Table 6.5 below identifies units of the coastal protected sites, identified in the previous sections that are water dependent and the condition of each of these, whether they are favourable or un-favourable due to water related issues.

**Table 6.5: Status of water dependant coastal protected sites under the WFD**

Protected site	Unit	Status under the WFD
Overstrand Cliffs SAC	Overstrand Cliffs	Favourable
Winterton-Horsey Dunes SAC	Winterton-Horsey Dunes	Favourable / Unfavourable
Great Yarmouth North Denes SPA	Winterton-Horsey Dunes	Favourable / Unfavourable

As part of the preparation of the unified SMP AECOM has produced a separate assessment entitled 'Retrospective Water Framework Directive Compliance' with regards to the potential effect of the SMP on the status of water bodies that are classified under the WFD. To avoid duplication of effort the SEA has considered the impact of the SMP on water quality, however a more detailed assessment of water quality issues are presented in the Retrospective Water Framework Directive Compliance Report.

### 6.2.6 *Sites of Special Scientific Interest*

Sites of Special Scientific Interest (SSSIs) are designated for their natural heritage, including plants and animal species, habitats, geology and landforms. They are designed to ensure their protection is taken into account when considering changes in land-use or other activities that could impact upon them.

The following section lists the coastal SSSIs from north to south that are located along the Kelling to Lowestoft Ness SMP and the reason for their designation. These sites have been illustrated on Figures 6.1 to 6.8 in Volume 3.

### Weybourne Cliffs

This site is located within policy unit 6.01 Kelling Hard to Sheringham between Weybourne Hope and Sheringham. The citation and condition for this site is presented in the box below.

#### **Favourable**

Cliffs east of Weybourne afford the best Pleistocene sections showing the pre-Cromerian deposits of the Cromer Forest bed. The pastonian 'Weybourne Crag' here at its type locality, with its marine molluscs has been known since the early days of geology. An historic site with outstanding Pleistocene sections of national importance.

The marine "crag" here have yielded both large and small mammal remains, of Pastonian and probably also pre-Pastonian age. Little has been published on these important fossils and the site remains one with considerable potential for future vertebrate finds.

Additional biological interest is provided by colonies and sand matins in the cliff-face and of fulmars on the cliff ledges.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### Beeston Cliffs

This site is located across the divide of policy units 6.02 – Sheringham and 6.03 – Sheringham to Cromer. The citation and condition for this site is presented in the box below.

#### **Unfavourable recovering**

This is the type of site for the Beestonian Stage of the Pleistocene. The cliffs provide sections in both marine and freshwater pre-Pastonian and Pastonian, Beestonian and Cromerian sediments. The Beestonian is especially well-developed with freshwater fluvial and pool deposits and marine beach gravels and sands. Pollen spectra have been obtained from many horizons through this varied sequence recording the pattern of vegetational changes which occurred as the sediments were being deposited. A nationally important Pleistocene reference site.

A nationally rare plant, Purple Broomrape *Orobanche purpurea* is present in unimproved calcareous grassland on the cliff top. The grassland sward is dominated by Timothy Grass *Phleum pratense*, Cocksfoot *Dactylis glomerata* and Yorkshire Fog *Holcus Lanatus*. A number of other characteristic species occur including Bird's foot Trefoil *Lotus corniculatus*, Lady's Bedstraw *Galium Verum*, Musk Thistle *Carduus nutans*, Restharrow *Ononis repens* and Knapweed Broomrape *Orobanche elatior*.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### West Runton Cliffs

This site is located within policy unit 6.03 – Sheringham to Cromer. The citation and condition for this site is presented in the box below.

#### **Favourable**

West Runton is one of the most important Pleistocene localities in the British Isles. In the cliff and foreshore are exposed a series of sediments representing two temperate stages (Pastonian, Cromerian) and three cold stages (Pre-Pastonian, Beestonian, Anglian). Pollen spectra indicative of temperate forests have been obtained from temperate stages, while the cold stage deposits show permafrost structures and subarctic herb floras. The whole Cromer Forest-bed Formation sequence is overlain by glacial tills of the Anglian Glaciation. The sequence records several periods of transgression and regression (major advances and retreats of the sea) represented by alterations of marine and non-marine sedimentation. The entire Cromerian Interglacial vegetational cycle is represented within the West Runton Freshwater Bed and Overlying marine sediments, and this locality has been designated the statotype for the Cromerian



stage. Molluscan and vertebrate fossils occur at several horizons, especially in the West Runton Freshwater Bed.

The West Runton Freshwater Bed (Cromerian Interglacial) has yielded by far the richest fauna of any Pleistocene site in Britain. Fossils, dated to pollen Zones Cr Ib –Ib, include a wide range of large and small mammals, freshwater fish and other vertebrates. The fauna has considerable international importance for its value in correlations with early Middle Pleistocene deposits across Europe and beyond. Marine gravels above with pollen dated to Zone Cr III have also yielded an interesting but sparse vertebrate assemblage. The Pastonian 'crag' below the Freshwater Bed contains abundant vertebrates, of particular note are the voles and marine fish – the only known fauna which can with certainty be assigned to this lower Pleistocene stage. An internationally important locality for its vertebrate faunas.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### East Runton Cliffs

This site is located in policy unit 6.03 – Sheringham to Cromer. The citation and condition for this site is presented in the box below.

#### **Favourable**

The foreshore at East Runton exposes pre-Cromerian (Lower Pleistocene) sediments, including successively 'Weybourne Crag' Pastonian clay conglomerate and marine shell bed, overlain in turn by marine silts (Pa II pollen zone). In the cliff can be seen spectacular rafts of chalk of glaciectonic origin (i.e. ice transported) and highly deformed 'Contorted Drift'.

The marine Lower Pleistocene deposits, here of pre-Pastonian and probable Pastonian age, contain an extensive vertebrate fauna which includes marine fish, voles, carnivores, extinct horse, rhinoceros, and elephant, and (notably) several species of 'comb-antlered' deer, Eucenoceras. This is the best available locality for fossil vertebrates of this age.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### Overstrand Cliffs

This site is located along the whole of policy unit 6.05 – Cromer to Overstrand with a small section located in policy unit 6.06 – Overstrand. The citation and condition for this site is presented in the box below.

#### **Favourable**

This stretch of coast between Cromer and Overstrand on the north-east coast of Norfolk provides the best example of soft cliff habitat in East Anglia. The cliffs are up to 70 meters high and exhibit a wide range of mobility which is reflected in a diverse range of sub-maritime habitats of considerable botanical, entomological and ecological importance. Exposures at the eastern end provide information concerning the glacial history of this area, and the Geological Conservation Review site falls within the boundary of the biological site.

The cliffs consist of unconsolidated Pleistocene sediments which are subject to cliff falls and slumping. This instability has led to the development of a successional series of habitats from bare sand and ruderal communities to semi-stabilised grassland and scrub. Freshwater seepage line emerging from the cliff-face and stable cliff-top grassland are important elements in the overall diversity of the site, which also supports an outstanding assemblage of invertebrates.

The cliff face which is exposed following falls consist of bare calcareous sand. This is initially colonised by species which are commonly associated with disturbance by man and forms an important example of a natural ruderal community where typically Coltsfoot *Tussilago farfara* is dominant. These slopes are of particular interest for their associated specialised coleopteran fauna with a number of rare species represented including the rove beetle *Bledius filipes* and the ground beetles *Harpalus vernalis* and *Nebria livida*. Fulmars nest on ledges and Sand Martins breed in holes in the cliff face.

On more stable slopes dry grasslands have developed. Those on the rather calcareous sands with some clay are dominated by Kidney Vetch *Anthyllis vulneraria* and Creeping Fescue *Festuca rubra* with a variety of associates including the grasses Yorkshire Fog *Holcus lanatus* and Yellow Oat-grass *Trisetum flavescens*; the herbs Ribwort Plantain *Plantago lanceolata*, Sand Sedge *Carex arenaria*, Autumn Hawkbit *Leontodon autumnalis*, Black Medick *Medicago lupulina* and Yarrow *Achillea millefolium*. On the sandier soils a community with Cat's Ear *Hypochaeris*



*radicata*, Sand Sedge *Carex arenaria*, Yorkshire Fog *Holcus Lanatus*, Creeping Fescue *Festuca rubra*, Early hair-grass *Aira praecox*, Bird's-foot Trefoil *Lotus corniculatus* and the moss *Polytrichum piliferum* is developed.

On the stable cliff-top grassland the notable Bulbous meadow-grass *Poa bulbosa* and the nationally rare parasitic Purple Broomrape *Orobancha purpurea* are present.

The freshwater seepages emerging from the cliff face deposit a heavier clay soil along their flush lines so that base rich flushes have developed. These are dominated in places by Marsh Horsetail *Equisetum palustre*, Jointed Rush *Juncus articulatus* and Sea Club-rush *Scirpus maritimus* with a carpet of bryophytes including *Aneura pinguis* and *Riccardia sinuata*. In two small areas tall fen with Reed *Phragmites australis* and Reedmace *Typha angustifolia* is developed. In the better defined parts of the flushes the red form of Early March Orchid *Dactylorhiza incarnata* var *coccinea* is frequent at its only East Norfolk locality together with Bee orchids *Ophrys apifera*, Southern Marsh Orchids *Dactylorhiza praetermissa* and Common Spotted Orchid *Dactylorhiza fuchsii*. The flushes are of considerable importance for breeding Diptera and in particular several rare or notable species of soldier-flies have been recorded, most notably *Oxycera morrisii*, *vanoyia tenuicornis* and *Statiomys potamida*.

On the cliff slopes towards the western end scrub and stunted woodland has developed. This is dominated by Sea Buckthorn *Hippophae rhamnoides* and Sycamore *Acer pseudoplatanus*, often overgrown with Clematis *Clematis vitalba*. At the base of the cliffs a small dune and narrow strandline add further to the diversity of the site.

The cliff section at Overstrand is one of several between Weybourne and Happisburgh which show a succession of glacial sequences, changing laterally from the three Cromer Tills, through the Contorted Drift to the Mary Drift; and a variety of deformation structures, some probably due direct glacial interference and some due to the weight of the overlying deposits. Important changes in the deposits and their deformation structures occur along the coast. At Overstrand all three Cromer Tills and intervening beds are present showing a variety of deformation structures due to both glacially-induced and loading disturbances. The special value of the site lies in the completeness of the succession and the variety and style of the deformations which are not seen elsewhere along the coast.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### Sidestrand and Trimmingham Cliffs

This site is located along the whole of policy unit 6.07 – Overstrand to Mundesley with small sections located in policy units 6.06 – Overstrand and 6.08 – Mundesley. The citation and condition for this site is presented in the box below.

#### **Favourable**

This stretch of cliffs between Overstrand and Mundesley on the north-east coast of Norfolk provides a fine series of geological exposures in unconsolidated Pleistocene sediment and in the underlying chalk. These cliffs, which extend for a distance of 6.5 kilometres and are up to 60 meters high, are subject to frequent cliff falls and slumping. This mobility creates a mosaic of habitats from bare clay and sand to ruderal communities and semi-stabilising grassland with occasional seepage line which support an outstanding assemblage of invertebrates.

Four aspects of the geology of the site are of special interest; the chalk, the Pleistocene sediments, fossil vertebrates and mass movement.

The chalk is exposed on the foreshore and cliffs in a series of blocks which have been thrust upwards by glacial action. It has a rich fossil invertebrate fauna which has enabled much of the chalk to be assigned to the Lower Maastrichtian stage i.e. very late Cretaceous age. These exposures comprise the only significant outcrops of chalk of this age in Britain and are therefore also the youngest Mesozoic rocks in the British Isles.

The common occurrence of the belemnite, *Belemnella lanceolata* (*Schlotheim*) indicates the lowest of four zones of the continental Maastrichtian stage and detailed studies of the brachiopod faunas have now facilitated detailed correlations with Lower Maastrichtian successions in Denmark, Sweden, Germany and Poland. A composite Lower Maastrichtian succession has been reconstructed by correlating the several chalk masses at Sidestrand and Trimmingham. The succession includes the type localities and reference sections of four lithographic units namely the Sidestrand Chalk, the Trimmingham Sponge Beds, the Little Marl Point and the Beacon Hill Grey Chalk members. Only the Sidestrand Chalk member is known at any other locality in Britain.

The Maastrichtian succession of the Sidestrand – Trimmingham district is of fundamental importance to the British Cretaceous geology and also has a wider significance to studies of the latest Cretaceous elsewhere in north-west Europe.

The cliffs at Sidestrand expose one of the best pre-glacial stratigraphic sequences in England. Analysis of their faunal and floral elements has led to the development of a detailed picture of the early Pleistocene environments in north Norfolk. At this locality unique domes of chalk thrust upwards by diapiric or glacio-tectonic processes are exposed in cliff sections and on the foreshore. Overlying sediments of the Cromer Forest Bed formation, displaced from their usual position at the below beach level, are consequently well exposed. The sequence includes fossiliferous Pre-Pastonian and Pastonian marine sediments, unconformably overlain by deposits of Cromerian age. This unconformity, of great importance for the interpretation of the Cromer Forest Bed Formation, is particularly well shown.

Sampling of the pre-pastonian and Pastonian beds has yielded an interesting mammalian fauna. The assemblage collected from the different sites are essentially the same and is dominated by the vole, *Mimomys pliocaenicus*. Other species recorded include other vole species eg. *Mimomys blanci*, a lemming *Lemmus* sp., and two species of desman *Galemys kormosi* and *Desmana thermalis*. At present it is thought that the composition of the Sidestrand vertebrate fauna suggests an age of 1.7 million years and is equivalent to the continental Villanyian.

The entire length of these cliffs has a substantial history of impressive rotational slumping affecting the Pleistocene deposits. The Sidestrand to Trimmingham stretch in particular is the finest site of slumping unconsolidated sediments in Britain. Huge collapses of the cliffs continue to occur, in places breaking through an elaborate set of coastal defence works which stretch along part of this coast.

This is probably the best soft rock cliff site for invertebrates in East Anglia. There are modern records for a number of rare coleoptera including *Nebria livida* and isopoda associated with the crevices and fallen debris at the bases of the cliffs. In addition there are old records for two Red Data Book beetles *Dyschirius obscurus* and *Bledius filipes*. Suitable conditions for these elusive and mobile species exist on this stretch of the coast and overlooked colonies may still be present.

The cliff top flora includes a large colony of species purple broomrape *Orobanche purpurea*, a Red Data Book species, which grows in grassland close to the cliff edge.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### Mundesley Cliffs

This site is located throughout the whole of policy unit 6.09 – Mundesley to Bacton Gas Terminal and a small section with policy unit 6.10 – Bacton Gas Terminal. The citation and condition for this site is presented in the box below.

#### **Favourable**

The cliffs along this stretch of coast provide some of the very best sections in the Pleistocene Cromer Forest-bed Formation, especially in Cromerian marine and freshwater deposits, and freshwater sediments of the early Anglian Cold Stage. At both Mundesley, and Paston – the type locality, marine and rarer freshwater deposits of Pastonian age are particularly well-developed. A nationally important site for its extensive Pleistocene sequence.

This site is designated for the Quaternary of East Anglia as the coastal cliffs are with Pleistocene Cromer Forest-bed Formation.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### Happisburgh Cliffs

This site is located within policy unit 6.12 Happisburgh. The citation and condition for this site is presented in the box below.

#### **Favourable**

This locality is important both for the cliff exposures which uniquely show three glacial deposits, the Cromer Till (of Anglian age) with intercalated waterlain sediments, and for the underlying Cromer Forest-bed Formation, exposed in the foreshore, with excellent development of pre-Pastonian and Pastonian sediments. An important site for dating the Pleistocene succession of East Anglia with a range of sediments from marine to freshwater and glacial, spanning five stages, from the pre-Pastonian to the Anglian.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### Winterton-Horsey Dunes

This site is located with policy unit 6.13 – Eccles to Winterton Beach Road and partly within policy unit 6.14 – Winterton to Scratby. The citation and condition for this site is presented in the box below.

#### **Favourable to unfavourable declining**

This site consists of an extensive dune system situated on the east coast of Norfolk between Hemsby and Horsey. The site is unusual in that it shows greater ecological similarities to the dune system of the west coast supporting acidic plant communities, than the geographically closer dunes within the North Norfolk Coast SSSI, where the sand is calcareous. The site supports well developed areas of dune heath, 'slacks' and dune grassland verging into grazing marsh and birch woodland. A wide range of both breeding and overwintering birds occur, including Little Terns on the foreshore, while the areas of scrub attract passage migrants. A rare amphibian breeds in shallow pools behind the main dune ridge, and the site is the only Norfolk locality for a rare butterfly. Part of the site embraces an earlier coastline and this feature together with dunes which have developed in front of it are of outstanding physiographical interest.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### Great Yarmouth North Denes

This site is located within policy unit 6.17 – Great Yarmouth. The citation and condition for this site is presented in the box below.

#### **Favourable**

The site consists of a dune system on the east coast of Norfolk between Great Yarmouth and Caister and is an important example of an accreting "ness" or promontory. It supports a full successional sequence of vegetation from pioneer to mature types; foredune, mobile dune, semi-fixed dune and dry acid dune grassland are all represented, the latter being particularly extensive. The largest United Kingdom breeding colony of the rare Little Tern is located on the foreshore.

There is a strip of accreting dune vegetation along most of the seaward edge of the dunes, consisting of the Sand Couch-grass *Elymus farctus* and Lyme-grass *Leymus arenarius*. Landward lies a band of mobile dune vegetation characterised by Marram *Ammophila arenaria* and Red Fescue *Festuca rubra*. Within this community the rare grass, Rush-leaved Fescue *Festuca juncifolia* is usually found. In places the mobile dune vegetation is backed by a more species-rich semi-fixed dune community.

The mobile and semi-fixed communities quickly give way to a broad band of fixed dune vegetation indicative of acid conditions, characterised by Sand Sedge *Carex arenaria* and the lichen *Cornicularia aculeata*. The nationally scarce Grey Hair-grass *Corynephorus canescens* is often very abundant and many species of lichens are also found. Towards the north of the site the vegetation appears less acid with areas of the Red Fescue – Lady's Bedstraw *Gallium verum* community frequently occurring. Landward of the seawall there is an extensive area of well developed acidic dune grassland with Sand Sedge, Sheep's Fescue *Festuca ovina* and Common Bent *Agrostis capillaris*.

The Little Tern colony has increased in size over each of the last five years with 201 pairs nesting in 1990. This represents 8.4% of the UK population, while the colony has supported an average of 133 breeding pairs during the last five years. Associated with the ternery, Ringed Plover also frequently nest.

The site is of physiographic significance as one of a number of 'ness' features which are characteristic of the East Anglian coast. However unlike many other dune systems in the region this site is actively accreting. It is this accumulation of sediment which is responsible for the good representation of mobile dune vegetation communities.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

### Corton Cliffs

This site is located within policy unit 6.22 – Corton. The citation and condition for this site is presented in the box below.

### Favourable

The cliff at Corton is geologically important because it is the type locality for the Anglian Cold Stage D during which occurred the most extensive Pleistocene glaciations of the British Isles. The cliffs expose a clear sequence of two tills with non-glacial water-lain sands between, together with a third till and associated deposits above. The whole Anglian sequence here can be clearly related to the underlying Cromerian freshwater beds. A nationally important Pleistocene site.

(Source: Natural England 2009 [www.natureonthemap.org.uk](http://www.natureonthemap.org.uk) )

#### 6.2.6.1

### Other SSSIs

There are a number of other SSSIs which are not located along the coast of the SMP area but which have been considered within the SEA due to their proximity to the coast. These are listed below and are presented on Figures 6.1 to 6.8 in Volume 3.

- Kelling Heath SSSI is located to the south of policy unit 6.01 – Kelling Hard to Sheringham, this site has been classified as unfavourable recovering.
- Weybourne Town Pit SSSI is located in the east of the village of Weybourne and has been classified as being in a favourable condition.
- Sheringham and Beeston Regis Commons SSSI is located in the southeast of Sheringham and has been classified as being in an unfavourable declining condition.
- Briton's Lane Gravel Pit SSSI is located to the south of Beeston Regis and has been classified as being in a favourable condition.
- Felbigg Woods SSSI is located to the south of West and East Runton and has been classified as being in a favourable condition.
- Paston Great Barn SSSI is located with the village of Paston to the west of Bacton Gas Terminal and has been classified as in a favourable condition.

#### 6.2.6.2

### SSSI Designated Sites with the Broads

Within the tidal floodplain there are a number of SSSIs protecting the mosaic of wetland habitats associated with the Broads rivers. These designated sites are listed below in Table 6.6 in accordance with the river catchment in which they are located.

**Table 6.6 Wetland habitat designated SSSIs**

River Catchment	SSSI designated site
Northern Broadland	<ul style="list-style-type: none"> <li>■ Calthorpe Broad SSSI</li> <li>■ Priory Meadows SSSI</li> <li>■ River Thurne SSSI</li> <li>■ Upper Thurne Broads and Marshes SSSI</li> <li>■ Ludham – potter Heigham Marshes SSSI</li> <li>■ Shallam Dyke Marshes SSSI</li> <li>■ River Ant SSSI</li> <li>■ Ant Broads and Marshes SSSI</li> <li>■ Alderfen Broad SSSI</li> </ul>
River Bure	<ul style="list-style-type: none"> <li>■ Bure Broads and Marshes SSSI</li> <li>■ Upton Broads and Marshes SSSI</li> <li>■ Trinity Broads SSSI</li> <li>■ Burgh Common and Muckfleet Marshes SSSI</li> <li>■ Damgate Marshes, Acle SSSI</li> <li>■ Decoy Carr, Acle SSSI</li> </ul>
River Yare	<ul style="list-style-type: none"> <li>■ Cantley Marshes SSSI</li> <li>■ Yare Broads and Marshes SSSI</li> <li>■ Limpenhoe Meadows SSSI</li> <li>■ Halvergate Marshes SSSI</li> <li>■ River Chet SSSI</li> <li>■ Hardley Flood SSSI</li> </ul>

River Catchment	SSSI designated site
	<ul style="list-style-type: none"> <li>■ Broadland Estuary SSSI</li> <li>■ Breydon Marshes SSSI</li> </ul>

## 6.2.7

*Non-statutory designations*

In addition to the designated sites that are described above there are a number of sites and features along the SMP area that are covered by non-statutory designations but which are also recognised by the statutory and non-statutory planning framework. These sites have been presented in Table 6.7 below:

**Table 6.7: Non-statutory designations**

Designation	Name
County Wildlife Sites CWS	<ul style="list-style-type: none"> <li>■ Kelling Hard CWS</li> <li>■ Beach Lane, Weybourne CWS</li> <li>■ Cromer Sea Front CWS</li> <li>■ Happy Valley, Cromer CWS</li> <li>■ Overstrand Cliffs CWS</li> <li>■ Marram Hills CWS</li> <li>■ Waxham Sands Holiday Park CWS</li> <li>■ California Coastal Strip CWS</li> <li>■ Gunton Warren CWS</li> </ul>
Nature Reserves	<ul style="list-style-type: none"> <li>■ Berney Marshes and Breydon Water</li> <li>■ Yarmouth North Denes Beach</li> </ul>

## 6.3

**Water Quality**

A Retrospective Water Framework Directive Appraisal report has been produced by AECOM (October 2009). This addresses the impact of the SMP on river, coastal, transitional and groundwater bodies within the SMP area and their compliance with the Water Framework Directive (WFD).

Tables 6.8 to 6.11 show the current status of the river, coastal, transitional and groundwater bodies along the SMP area.

**Table 6.8: River water quality**

Waterbody type	Name	Current ecological status	Current chemical quality
River	River Mun	Good status	Pass

**Table 6.9: Coastal Water Quality**

Waterbody type	Name	Current ecological potential	Current chemical quality
Coastal	Norfolk East	Moderate	Pass
Coastal	Suffolk	Moderate	Pass

**Table 6.10: Transitional water quality**

Waterbody type	Name	Current ecological potential	Pass
----------------	------	------------------------------	------

Transitional	Bure, Waveney, Yare and Lothing	Moderate	Pass
--------------	---------------------------------	----------	------

**Table 6.11: Groundwater water quality**

Waterbody type	Name	Current quantitative status	Current chemical status
Groundwater	North Norfolk Chalk	Good	Poor
Groundwater	Broadland Rivers Chalk and Crag	Poor	Poor

### 6.3.1 *Historical Landfill Sites*

There are a number of historical landfill sites located in coastal areas between Kelling Hard and Lowestoft Ness. These are shown on Figures 11.1 to 11.24, constraints maps. No current landfill sites have been identified within these coastal areas. If erosion of the coastline is allowed to take place where a landfill site is located without remediation this could have adverse impacts on coastal water quality.

## 6.4 **Climate**

### 6.4.1 *Climate Change*

Global temperatures have risen by about 0.6°C since the beginning of the twentieth century of which it is thought 0.4°C has occurred since the 1970's.

Predictions of temperature rise have been developed by the UK Climate Impacts Programme (UKCIP) 2002 for four possible future climate scenarios: Low, Medium-Low, Medium-High and High; these span a range of emission scenarios and different climatic sensitivities. The Living with Climate Change in the East of England Stage 1 Report: Guidance on Spatial Issues (Land Use Consultants in association with CAG Consultants and SQW Limited February 2003) has used the Low emissions and High emissions scenarios to predict future climate change in the East of England.

- Low Emissions (increase in global temperature by 0.2oC by the 2080s)
- High Emissions (increase in global temperature of 3.9oC by the 2080's)

The report predicts that under the low emissions scenario annual warming by the 2080s will be between 2°C and 2.5°C this increases to 3.5°C to 4.5°C under the high emissions scenario.

The report also addresses the change in rainfall patterns within the East of England under the two scenarios. Under the low emissions scenario it is predicted that winters will become 10-20% wetter and summer drier by 20-30% resulting in a net decrease in rainfall between 0 and 10%. Under the high emissions winters are predicted to become wetter by between 25-35% and summers dryer between 40-60% resulting in a net decrease in precipitation between 0 and 10%.

In addition to changes in precipitation, it has been predicted that the intensity of winter precipitation will increase under the low emissions scenario between 0.25 and 0.75 days by the 2080s and under the high emissions scenario between 0.75 and 1.25 days by the 2080s. This may impact on the soft cliffs along this coastline by increasing the likelihood of large-scale slope failures.

### 6.4.2 *Sea level rise*

Predicted climate change and sea level rise (eustatic change) presents a significant challenge for future coastal management. This is exacerbated by isostatic change along the East Anglian coast where the land has been subsiding at a rate of between 0.7 and 2mm/year. Evidence suggests that the sea level rose by about 1.5mm /year during the twentieth century. However, after adjustment taking into account isostatic change it was calculated that the average rate of sea-level rise during the last century around the coast of the UK was approximately 1mm/year<sup>3</sup>.

Within the East of England under the low emissions scenario it is predicted that there will be a net sea level rise of approximately 22cm (taking into account isostatic change) by the 2080s and under the high emissions scenario 82cm (taking into account isostatic change) by the 2080s. Defra 2003 also made a recommendation of 6mm/year sea level rise for the Anglian Region which has been used in the assessment of the SMP.

In addition to isostatic change, it is predicted that extreme sea levels due to storm surges are expected to increase in size and frequency. Within the East of England under the low emissions scenario it is predicted that a 50 year return surge height will increase by up to 1m with the present one in 50 year storm surge event occurring every 10 years by the 2080s. Under the high emissions scenario it is predicted that the surge height will increase to 1.4m with the one in 50 year storm surge event becoming more often than once in one year by the 2080s. However, it should be noted that there is a high degree of uncertainty and little agreement between the models, regarding changes in mid-latitude storm intensity, frequency and variability.

## 6.5 Landscape

Much of the Kelling to Lowestoft Ness SMP falls within the Norfolk Coast Area of Outstanding Natural Beauty (AONB). This area comprises of a large coastal area within North Norfolk and a smaller area to the south which coincides with the Broads Authority Executive Area between Winterton and Horsey. The AONB has been illustrated on Figures 7.4 to 7.5 within Volume 3.

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

The statutory purpose of designating an AONB is to conserve and enhance the natural beauty of the area which comprises the area's distinctive landscape character, biodiversity and geodiversity, historic and cultural environment. For the Norfolk Coast AONB this includes the wider statutory objectives for the North Norfolk Heritage Coast.

The Norfolk Coast AONB can be divided into four distinct areas according to coastal processes. The areas which fall within the remit of this SMP are Weybourne to Bacton which is characterised by soft cliffs of glacial material, slumping through groundwater action and erosion; areas defended by seawalls which reduce energy, and beaches with groynes to reduce sediment movement. The second area is Sea Palling to Winterton-on-Sea which is characterised by acidic dunes, mostly protected by the seawall and artificial reefs and groynes to reduce sediment movement.

The Norfolk Coast AONB has been identified as subject to four key external pressures, coastal processes, climate change, development pressures, global market forces and policy. Table 6.12 sets out a summary of the approach to management of the AONB for each of the four pressures.

**Table 6.12: Approach to managing the pressures on the AONB**

Pressure	Summary of management approach
Coastal processes	To ensure that the predictions of coastal change and its impacts are better understood and inform the key decisions that affect the coastal zone. To plan and prepare for managed change which maintains the special qualities of the area in such a way that any negative impacts on coastal communities and habitats can be properly mitigated.
Climate change	To improve understanding for potential changes and impacts



Pressure	Summary of management approach
	To plan and prepare for local adaption to the effects of climate change and to undertake suitable adaptation measures to reduce any negative future effects of climate change.
Development pressures	To manage development and co-ordinate approach across the local planning system, achieving a consistent and co-ordinated approach across the area by using the Integrated Landscape Character Guidance for the area.  Develop a consistent and co-ordinated approach to influencing development issues outside local control that have potential impacts on the area's natural beauty.
Global market forces	Co-ordinate approach to influencing national and international policy where practical and develop local plans for adaptation to policy initiatives, where possible.

(Source: Norfolk Coast Partnership [www.norfolkcoastaonb.org.uk](http://www.norfolkcoastaonb.org.uk) November 2009)

### 6.5.2

#### *Character of the AONB*

The AONB has been designated for a number of reasons including: the interrelationship of dynamic coastal features such as saltmarsh, dunes, shingle and eroding sand and gravel; the link between the land and the sea; dynamic coastal landforms and processes; the sharp contrast between the flat marsh area and open farmed chalklands which are separated by the coastal road; and at national level it is one of the few remaining examples of relatively underdeveloped and unspoilt coastal areas of this character.

At a regional level the AONB is a rich and diverse compliment to the intensive agricultural landscapes that dominate East Anglia. Key characteristics include the variation in the character of coastal settlements compared to those in the hinterland.

A condition assessment of the area's natural beauty has been undertaken by Norfolk Coast Partnership. Table 6.13 below lists the quality of natural beauty that have been identified for the AONB along with the what the implication of implementing the SMP will be on these qualities.

**Table 6.13: Quality assessment of North Norfolk AONB and implications of the SMP**

Quality of natural beauty	Summary assessment	Implications of the SMP
Dynamic character and geodiversity of the coast	Majority of the SSSIs along the coast are in favourable condition with the exception of part of Winterton-Horsey Dunes SSSI which is in an unfavourable condition.	In general, the overall aim of the SMP is to achieve a naturally functioning coastline which will have a positive impact on this quality. Where any part of a SSSI is prevented from eroding naturally by coastal defences this will have a negative impact in this quality, however it should be noted that the majority of large settlements where defences are likely to be maintained fall outside of the AONB.
Links between land and sea	Difficult to assess as further work is required to understand the key characteristics of the relationship	Where the policy options result in the cliffs eroding naturally this should have a positive impact on this quality. Where defences are currently present and will be allowed to erode this will change the current link between land and sea, however it should be noted that the end result would be a more naturally functioning coastline which will be beneficial for this quality. The main towns where the defences are likely to be maintained are outside of the AONB area so this quality is unlikely to be affected in these areas. However it should be recognised that if the areas that continue to be defended form promontories preventing the movement of sediment along the coast this could change the character of areas either side of the town which do fall within the AONB that are being allowed to erode naturally resulting in the



Quality of natural beauty	Summary assessment	Implications of the SMP
		formation of bays, impacting on this quality.
Variety, richness and interrelationships between landscapes, settlements, settlement patterns, building character and archaeology across the area, based on local geology, history and culture.	Weakening of the character in the west of the AONB due to changes in agricultural practices. In the east of the AONB the main changes have been the character of the larger settlements. According to a Countryside Quality Count (CQC) assessment the character of the Heritage coast is stable although some features are in a neglected state.	Where the policy options result in the loss of property and or areas of archaeological or historical importance this will result in a change in a change to this quality.
Distinctive habitats based on local conditions and management, and species that depend on them – many but not all coastal, many of international importance.	Better data is required for Biodiversity Action Plan (BAP) species and County Wildlife Sites (CWS). SSSIs are in good condition overall and populations of key coastal birds are faring very well, with a few exceptions. Water quality is stable or improving in general.	In general the overall aim of achieving a naturally functioning coastline will have positive effects on this quality as the SSSIs will be allowed to erode naturally. In contrast letting the coastline erode could have negative impacts on some CWS which could be lost as a result.
Low level of development and population density for lowland England, leading to sense of tranquillity and, for undeveloped parts of the coast, of wildness.	Population within the AONB is almost stable.	The implementation of the SMP policies is unlikely to result in an increase in population within the AONB. Instead where property is lost as a result of coastal erosion the population could decrease or be redistributed within the AONB as a result of this loss thus having an impact on this quality.
Richness of archaeological heritage and historic environment, and how these relate to the present landscape.	Listed buildings within the AONB are generally in good condition but only just over half of the scheduled monuments.	Where the SMP policy options result in a loss of archaeological historical sites through allowing natural coastal erosion this will have a negative impact on this quality.

(Source: Adapted from Norfolk Coast Partnership [www.norfolkcoastaonb.org.uk](http://www.norfolkcoastaonb.org.uk))

### 6.5.3

#### *Landscape Character Areas*

The UK has been divided into a series of Landscape Character Areas. These areas are characterised by their uniqueness and defined as “a distinct, recognisable and consistent pattern of elements, be it natural (soil/landform) and/or human (for example settlement and development) in the landscape that makes one landscape different from another, rather than better or worse”. From these Landscape Character Areas England has been sub divided again into areas with similar landscape character which are called National Character Areas (previously known as Joint Character Areas).

The Kelling to Lowestoft Ness SMP falls within 5 of these National Character Areas which are detailed below and have been illustrated on Figures 7.1 to 7.3 in Volume 3.

- North Norfolk Coast
- Central North Norfolk
- North East Norfolk and Flegg
- The Broads
- Suffolk Coast and Heaths

Further information on the landscape character of the SMP area has been presented in Section 6.6 below Policy Unit Characteristics.

## **6.6 Archaeology and the Historic Environment**

Norfolk has a recorded history dating back to AD 1000. There are a number of sites of high archaeological importance within the coastal zone. The coastal strip contains a significant number of wartime defences, many of which have already been lost as a result of coastal erosion, due to their strategic position on cliff tops.

Between Kelling and Lowestoft Ness there are a number of Scheduled Ancient Monuments, Listed Buildings and Historic Parks and Gardens.

Archaeology and the historic environment is described in more detail in Section 6.9 below (Policy Unit Characteristics) and is presented on Figures 10.1 to 10.9 in Volume 3.

## **6.7 Population**

The following section provides a summary of the key commercial areas and economic activity along the Kelling to Lowestoft SMP area. More detail is provided on population within Section 6.6 Policy Unit Characteristics.

### **6.7.1 Commercial**

There are a number of coastal towns along the SMP area from north to south these are, Sheringham, Cromer, Great Yarmouth, Gorleston and Lowestoft, all of which are major residential and tourist areas with the primary industry in these areas being tourism. Cromer and Sheringham also support a commercial fishing industry for brown crab and lobster.

### **6.7.2 Agricultural**

The land between these commercial centres primarily supports the agricultural industry in particular cereal production with Grade 1 agricultural land situated between Bacton and Waxham.

### **6.7.3 Recreation and tourism**

Tourism is the primary economic sector along this stretch of the coastline, An Economic Strategy for Norfolk and Waveney, 1997-2007 (Source - Facing the Future website) identified that tourism and recreation accounted for approximately 37,000 jobs within these areas with a large proportion of this situated along the coast and within the Broads.

Visits to the area tend to be short term and from within the UK with the towns of Great Yarmouth and Lowestoft seeing a gradual decline in long stay tourism since the 1970s.

Visitors are attracted to the area for a range of reasons including bathing beaches, watersports and land based recreation (including walking, cycling and fishing).

#### 6.7.4

##### *North Norfolk*

Within the local authority of North Norfolk, 52.8% of the population are of working age of which 5.8% were unemployed in the year April 2008 to March 2009. In the year January 2008 to December 2008 of those of working age 11.9% had no qualifications compared to 23.9% achieving the highest level qualifications of NVQ4 and above. The average weekly earnings of people in employment in the year 2008 were £383.7.

Within North Norfolk 13.7% of jobs were tourism related in 2007 and there were 250 VAT business registrations compared to 220 de-registrations.

The data detailed above is for the whole of North Norfolk Table 6.14 below presents data for the eight wards in North Norfolk which are coastal.

**Table 6.14: North Norfolk coastal ward statistics.**

Ward	Working age population (2001) (%)	Unemployed (2001) (%)	Highest employment sector (2001) (%)	No qualification or level unknown of the working age population (2001) (%)	Higher level qualifications of the working age population (2001) (%)
Chaucer	47.7%	4.2%	Skilled trades 19.3%	45.3%	16.6%
Happisburgh	58.6%	4.7%	Skilled trades 18.4%	47.2%	14.6%
High Heath	48.3%	2.7%	Skilled trades 17.3%	41.4%	20.0%
Mundesley	51.3%	5.0%	Managers and senior officials 17.4%	45.6%	12.8%
Poppyland	53.6%	7.6%	Skilled trades 18.1%	43.4%	14.2%
St Benet	53.9%	0.0%	Managers and senior officials 20.2%	35.2%	20.8%
The Runtons	51.5%	3.5%	Managers and senior officials 19.3%	39.1%	16.3%
Waxham	61.3%	5.8%	Skilled trades 22.0%	46.3%	14.8%

#### 6.7.5

##### *Great Yarmouth*

Within the local authority of Great Yarmouth, 57.6% of people in 2008 were of working age and of these 7.9% were unemployed. In the year January 2008 to December 2008 20.2% of the population of working age had no qualifications, compared to 11.6% with the higher level qualification of NVQ4 and above. In 2008 the average gross weekly pay of people in employment was £412.5.

Within Great Yarmouth 16.4% of jobs in 2007 were tourism related and in the same year there were 200 VAT business registrations compared to 155 de-registrations.

The data detailed above is for the whole of Great Yarmouth local authority, Table 6.15 below presents data for the ten wards in Great Yarmouth which are coastal.

**Table 6.15: Great Yarmouth coastal ward statistics.**

Ward	Working age population (2001) (%)	Unemployed (2001) (%)	Highest employment sector (2001) (%)	No qualification or level unknown of the working age population (2001) (%)	Higher level qualifications of the working age population (2001) (%)
Bradwell and South Hopton	56.6%	5.5%	Skilled trades 15.0%	43.1%	11.3%
Caister North	59.6%	6.0%	Elementary occupations 14.6%	46.9%	7.8%
Caister South	54.5%	8.2%	Skilled trades 17.1%	51.2%	7.8%
Central and Northgate	61.4%	14.3%	Elementary occupations 18.1%	51.3%	6.5%
East Flegg	58.5%	6.1%	Skilled trades 15.6%	47.1%	9.6%
Gorleston	54.9%	6.4%	Managers and senior officials 16.5%	37.7%	17.3%
Nelson	55.0%	20.0%	Elementary occupations 22.0%	55.7%	5.2%
Ormesby	58.6%	6.2%	Managers and senior officials 16.3%	43.3%	11.9%
St Andrews	59.6%	10.2%	Elementary occupations 15.5%	44.0%	7.7%
Yarmouth North	50.1%	10.1%	Elementary occupations 16.9%	52.8%	7.3%

#### 6.7.6

#### Waveney

Within the local authority of Waveney, 56.2% of the population were of working age in 2008 of which 5.7% were unemployed. In the year 2008 16.4% of people of working age had no qualifications compared to 15.3% who had the highest level qualification NVQ4 and above. In the same year the gross weekly pay was £427.4.

Within Waveney in 2007 10.4% of jobs were tourism related and in the same year there were 245 VAT business registrations compared to 200 de-resignations.

The data detailed above is for the whole of Waveney local authority, Table 6.16 below presents data for the two wards in Waveney which are coastal and fall within the remit of this SMP.

**Table 6.16: Waveney coastal wards within the remit of this SMP statistics**

Ward	Working age population (2001) (%)	Unemployed (2001) (%)	Highest employment sector (2001) (%)	No qualification or level unknown of the working age population (2001) (%)	Higher level qualifications of the working age population (2001) (%)
Gunton and	50.7%	5.7%	Managers and senior officials	38.7%	19.9%

Ward	Working age population (2001) (%)	Unemployed (2001) (%)	Highest employment sector (2001) (%)	No qualification or level unknown of the working age population (2001) (%)	Higher level qualifications of the working age population (2001) (%)
Corton			15.4%		
Harbour	55.8%	12.6%	Elementary occupations 19.1%	45.4%	8.9%

## 6.8 Human Health

### 6.8.1 Bathing water quality

The quality of bathing water is monitored at ten locations along the SMP area. These locations and the quality at these locations are detailed in Table 6.17.

**Table 6.17: Bathing water quality**

Sampling Location	Description of bating water quality	Current bathing water quality (2008)
Sheringham	The bathing water quality at this location has been excellent every year between 1993 and 2008 with the exception of 2007 when it was classified as good.	Excellent
Cromer	The bathing water quality at this location has been classified as excellent between 1998 and 2008	Excellent
Mundesley	The bathing quality at this location has been classified as excellent between 1997 and 2008 with the exception of 2001 when it was classified as good.	Excellent
Sea Palling	The bathing water quality has been classified as excellent between 2002 and 2008. The quality was not monitored at this location before 2002	Excellent
Hemsby	The bathing water quality at this location has been classified as excellent between 1995 and 2008 with the exception of 1997 and 2000 when it was classified as good	Excellent
Caister Point	The bathing water quality at this location has been classified as excellent between 2003 and 2008	Excellent
Great Yarmouth North	The bathing water quality at this location has been classified as excellent between 1997 and 2008 with the exception of 2004 when it was classified as good	Excellent
Great Yarmouth Pier	The bathing water quality has been intermittently excellent and good between 1996 and 2008.	Excellent
Great Yarmouth	The bathing water quality has been intermittently excellent and good between 2003 and 2008. However this bathing water was classified as poor quality in 2001	Excellent
Gorleston Beach	The bathing water quality has been classified as good in 2007 and 2008 with excellent quality between 2002 and 2006	Good

## 6.9 Policy Unit Characteristics

The following section provides a summary of the baseline conditions for each of the 24 policy units which make up the Kelling to Lowestoft Ness SMP. Detailed information can be found in Appendix 2.2 and 2.3 Baseline Process Understanding and Thematic Studies.

#### 6.9.1

##### *Policy Unit 6.01 Kelling Hard to Sheringham*

There are low unconsolidated cliffs along much of this frontage. The cliffs disappear at Weybourne and a shingle bank protects low-lying land behind. The cliffs are present again to the east of Weybourne and increase in height towards Sheringham.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.1 and 9.1 respectively in Volume 3.

##### Historic Environment

Along the coastal strip there are a number of sites listed in the SMR, a number of which appear to have already been lost through coastal erosion. The majority of sites are related to wartime defences, for example gun emplacements and pill boxes, and several of these are noted to be of high importance as they represent rare examples. Other historic features along this policy unit have been presented on Figure 10.1 in Volume 3.

##### Population

There is very little development along this stretch of coastline, apart from the village of Weybourne, which is set back from the coast approximately half a kilometre, along the main coast road, the A149. There is a beach access point and car park at Weybourne, which is easily accessed from the A149. The Norfolk Coast Path runs along the coast. Agriculture is the main industry here and the agricultural land along this stretch is Grade 3. The National Trust owns a section of land and this is in stewardship or set-aside.

#### 6.9.2

##### *Policy Unit 6.02 – Sheringham*

Along this policy unit there are unconsolidated cliffs between 20 and 25m in height and in places include large chalk boulders. The cliffs have been regraded and form a grassed slope along the town frontage. The beaches are comprised of shingle and there is an upper pebble-sized beach. This is underlain by a chalk platform. The beach in front of the town is relatively narrow.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.2 and 9.1 respectively in Volume 3.

##### Historic Environment

There is a Conservation Area surrounding the parish of Upper Sheringham. There are a number of monument sites listed within the SMR; the Observation Post on Beeston Regis Hill (HER no. 21298) is noted as a rare example and therefore of high importance and 'The Lees' (or St Nicholas' Gardens) (HER no. 33527), an historic garden, is also noted to be of high importance (ranked as a grade two-star in Norfolk Historic Gardens Survey). Other historic features within this policy unit have been presented on Figure 10.1 in Volume 3.

##### Population

Sheringham is a traditional seaside town, which includes a mixture of Victorian and Edwardian houses and fishermen's cottages. It is an important holiday and tourist centre, which is predominantly focussed on the coastal activities; attractions include a variety of shops, galleries and boutiques, clean, golden, sandy beach (which was awarded a 2003 Blue Flag), North Norfolk Steam Railway, a 18 hole golf links set on the cliff top and 'The Splash' Leisure Complex. Windsurfing, surfing, canoeing and jet-skiing also take place from the beaches.

Due to its landscape qualities it also attracts visitors interested in walking, horse riding and cycling, and the Norfolk Coast Path runs along the cliff top. This path, in conjunction with

Peddars Way, contributes to the National Trail network of walkways and bridleways spanning the country. The North Norfolk Shoreline Management Plan's strategic objective for the Norfolk Coast Path is to maintain its integrity.

Associated with the tourist industry, the area contains both temporary and permanent caravan and campsites. Together with a number of hotels. Although some of the businesses in the town are predominantly focussed towards providing services for local residents, many are associated with the tourist industry.

Policy HT2 of the North Norfolk Structure Plan recognises Sheringham as a coastal holiday centre where tourist facilities accommodation in permanent buildings will be permitted.

In terms of major non-tourist infrastructure, there is an inland rescue boat (IRB) station at Sheringham as well as the usual infrastructure elements associated with an urban area. There is also a sewage pumping station on the promenade which serves the whole of Sheringham Upper Sheringham and Weybourne.

### 6.9.3 *Policy Unit 6.03 – Sheringham to Cromer*

There are unconsolidated cliffs, 20 to 40m high, which in places include large chalk boulders (erratics) along this frontage. These cliffs lie on a chalk platform, which dips eastwards. The beach composition changes slightly from that to the east and is predominantly sandy with a thin veneer of shingle.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.2 and 9.1 respectively within Volume 3.

#### Historic Environment

Between Sheringham and Cromer there is a number of monument sites, many of which relate to evidence of previous industry, e.g. brick works (HER no. 6420) and a lime kiln (HER no. 6422), or wartime defences. Some sites identified in the SMR have already been lost through coastal erosion and there are two sites that are identified as being of high importance: a moat (HER no. 6394), which may relate to the former site of a windmill, and a ring ditch' identified through cropmarks, which may be evidence of a burial mound (HER no. 6352). Other historical features along this policy unit have been illustrated on Figures 10.1 to 10.2 in Volume 3

#### Population

Between Cromer and Sheringham the cliff top land is predominantly used for agricultural purposes, but there are also cliff-top caravan sites, which provide accommodation for visitors to the area. The Norfolk Coast Path is diverted inland at this point. There are also car parks and beach access points along this section of at West Runton and East Runton. These are particularly important for water-based recreation such as boating, non-commercial fishing, windsurfing and jet skiing. Inland are the villages of West Runton and East Runton, which are predominantly residential centres.

The National Trail continues along this frontage.

### 6.9.4 *Policy Unit 6.04 – Cromer*

There are unconsolidated cliffs, which have been regraded and grassed along the town frontage. The cliffs vary in height between 20 and 50m and in places include large chalk boulders (erratics) which are a result of glaciations. These cliffs lie on a chalk platform, which dips eastwards. The chalk outcrops at the base of the cliffs. The beach is predominately sandy with a thin veneer of shingle at the base of the cliffs.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.3 and 9.1 respectively within Volume 3.

#### Historic Environment

There are two sites noted as high importance within the SMR records: 'Sunken and Evington Gardens' (HER no. 33461) and a 'loopholed' wall (HER no. 32565), which includes three very rare loopholes (dated 1940). Within Cromer other listed buildings include: Grade II listed Cromer Baptist Church (HER no. 36515), the gangway and Cromer Pier (HER no. 39328) and Grade I St Peter's and Paul's Church. The central sea walls, promenade and the retaining walls are also Grade II listed. Other historic features within this policy area have been illustrated on Figure 10.2 in Volume 3.

#### Current and future land use

Cromer is an important tourist centre for North Norfolk, with attractions predominantly being coast-based. The promenade and beach is a particular attraction and the beach was awarded a Blue Flag in 2003. The town offers a number of hotels and associated facilities such as restaurants, pubs and shops. The town also attracts visitors due to its landscape quality, featuring Victorian architecture along the frontage, a pier dating from the early 1900s and a Grade I church.

As well as the usual urban infrastructure, there is an RNLI lifeboat station at Cromer, which is part of a national network. The main coastal road, the A149 runs along the coastal frontage and is an important link to adjacent towns and one that would not be easily rerouted. There is also a sewage pumping station located in the promenade that serves Cromer, Overstrand and Sidestrand.

### 6.9.5 *Policy Unit 6.05 – Cromer to Overstrand*

Along this policy unit there are unconsolidated cliffs that reach heights of up to 60m. The cliffs are characterised by significant failures, such as rotational slides and slump scars and vary in composition along the shoreline. There is very little permanent backshore along this shoreline, and in places no backshore is present.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.3 and 9.1 respectively within Volume 3.

#### Historic Environment

There is only one monument site listed in the SMR records, but this has not been identified as high importance. Other historic features within this policy unit have been presented on Figure 10.2 in Volume 3.

#### Current and future land use

The main use of this coastal strip is the Royal Cromer Golf Course. There is also a cliff top footpath along this stretch.

### 6.9.6 *Policy Unit 6.06 Overstrand*

Along this policy unit there are unconsolidated cliffs that reach heights of up to 30m. The cliffs are characterised by significant failures, such as rotational slides and slump scars and vary in composition along the shoreline. There is very little permanent backshore along this shoreline, and in places no backshore is present.

The landscape and character along this frontage have been presented on Figure 9.1 within Volume 3.

#### Historic Environment

A number of artefacts of prehistoric date were found in the vicinity of the proposed cable route at Overstrand for the Cromer offshore windfarm (Posford Haskoning, October 2002). The earliest of these artefacts are possible eoliths recovered from the Cromer Forest Bed, a Pleistocene deposit dating approximately 500,000 BC. A stone axe worked flints, including scrapers, of Neolithic date (4,000 to 2,500 BC) have been recovered from the beach at Overstrand. There are two Grade II listed houses along the coastal strip at Overstrand: 'The



Pleasance' (HER no. 6477) (includes the Lutyens buildings) and 'Sea Marge' (HER no. 25396). The Pleasance is also listed as a Historic Park and Garden. The historical features within this policy unit have been presented on Figure 10.1 in Volume 3.

#### Population and Current and future land use

Overstrand is a quiet seaside village. Its main attraction is its beach and there are beach access points along the frontage, which lead down to the promenade. It is mainly residential but does include a couple of hotels, a caravan site and two corporate holiday institutions. Crab fishing represents a small industry at this location.

There is a sewage pumping station in the car park serving Overstrand and Sidestrand and a storage tank sewer which is located under the corner of Pleasance garden.

### 6.9.7

#### *Policy Unit 6.07 – Overstrand to Mundesley*

There are unconsolidated till cliffs that can reach heights of up to 75m along this frontage. The cliffs are characterised by significant failures, such as rotational slides and slump scars and vary in composition along the shoreline. The cliffs gradually reduce in height towards Mundesley. There is little permanent backshore, and in places no backshore is present. Occasionally glacial chalk is exposed on the foreshore. Towards the south the chalk layer disappears and is replaced by a clay platform. Occasionally this is exposed and subject to marine erosion.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.4 and 9.1 respectively within Volume 3.

#### Historic Environment

The route of the former Norfolk to Suffolk Joint Railway, features of modern archaeological interest, runs in an east-west direction south of the road B1159 to Mundesley. This line was opened in 1898 and was closed in 1953. Two of the monument sites listed in the SMR have already been lost through cliff erosion and the third has not yet been defined as high importance. Historical features within this policy unit have been presented on Figures 10.2 to 10.3 in Volume 3.

#### Population

The predominant use of the cliff top land is for agriculture and this is designated as Grade 3 farming land. The small village of Sidestrand is set a couple of hundred metres from the coast and contains a small number of mainly residential properties. The village of Trimingham is situated at the coast and again includes predominantly residential properties.

Both villages include churches, which have a heritage and landscape value as well as community value. The coastal road between Trimingham and Mundesley runs along the cliff edge and is therefore potentially at risk. There is also an MOD communications facility along this frontage, but this is a mobile facility, which could possibly be relocated if necessary.

### 6.9.8

#### *Policy Unit 6.08 – Mundesley*

Along this policy unit there are unconsolidated cliffs approximately 25-35m in height. The cliffs are slightly sandier than those to the north and the failures are typically due to shallow landslides. There is a very little permanent backshore along this shoreline, and in places no backshore is present. The beach rests on a clay platform and occasionally this is exposed and subject to marine erosion.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.5 and 9.1 respectively within Volume 3.

#### Historic environment

There are a number of monument sites recorded in the SMR, including two identified as high importance: a Tank Trap (HER no. 32621) and an underground military headquarters with

associative gun emplacement (HER no. 14142), which is probably the only one left intact in Norfolk.

In addition there are two Grade II listed buildings: All Saints Church (HER no. 6884) and a Brick Kiln (HER no. 14141), which is believed to be the only surviving 'haystack' kiln in the country and thus of considerable importance. Historical features within this policy unit have been presented on Figure 10.3 in Volume 3.

#### Population

Mundesley is a small holiday resort, which predominantly attracts tourists to the beach, and during the summer Mundesley's population increases considerably. Mundesley has been awarded the Blue Flag for its waters and high standards. The town contains important tourist accommodation and facilities including promenade, café and attractions, maritime museum, car parking areas and beach access points. There are also local community facilities such as churches and a library.

The cliff top Mundesley Holiday Camp and Hillside Chalet Park are very important tourist attractions and there is an access from these sites to the beach.

As well as normal urban infrastructure, there is potential for loss or damage to the AW outfall head works. There is also a need to maintain access to outfall screens for Mundesley Beck. The coastal road that links Mundesley to coastal villages to the west is also potentially at risk. On the coast there is an IRB lifeboat station, which forms part of a network around the coast of the UK.

### 6.9.9

#### *Policy Unit 6.09 – Mundesley to Bacton Gas Terminal*

There are low unconsolidated cliffs, between 5 and 10m high, which generally fail through landsliding but which are presently stable. There is very little permanent backshore along this shoreline, and in places no backshore is present.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.5 and 9.2 respectively within Volume 3.

#### Historic Environment

There are only a few recorded monument sites along this stretch, but one of noted high importance is the remains of an Early Saxon cemetery (HER no. 6872) between Mundesley and Bacton Gas Terminal.

Mundesley Holiday Camp is also a recorded building (HER no. 34570) as it was the first purpose built full catering holiday camp in Norfolk and second in Britain. Historical features within this policy unit have been presented on Figure 10.3 in Volume 3.

#### Population

A key feature along this section is the Bacton Gas Terminal, which is an important feature both in terms of infrastructure and local employment. The terminal consists of subsurface pipelines to offshore gas field and cliff top sites with gasometers and communication towers. There are also impacts on communication linkages to and from the site. Between Mundesley and the terminal, the main land use is agricultural, with the land classified as Grade 1 quality.

### 6.9.10

#### *Policy Unit 6.10 – Bacton Gas Terminal*

There are low, unconsolidated cliffs, between 5 and 10m high along this frontage.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.5 and 9.2 respectively within Volume 3.

#### Historic Environment

There are only a few recorded monument sites along this stretch, but one of noted high importance is the remains of an Early Saxon cemetery (HER no. 6872) between Mundesley and

Bacton Gas Terminal. Historical features within this policy area have been presented on Figure 10.3 in Volume 3.

#### Population

A key feature along this section is the Bacton Gas Terminal, which is an important feature both in terms of infrastructure and local employment. The terminal consists of subsurface pipelines to offshore gas field and cliff top sites with gasometers and communication towers. There are also impacts on communication linkages to and from the site. Between Mundesley and the terminal, the main land use is agricultural, with the land classified as Grade 1 quality.

### 6.9.11

#### *Policy Unit 6.11 – Bacton, Walcott and Ostend*

There are unconsolidated till cliffs, which drop down to beach level at Walcott, creating a short gap in the line of the cliffs that run from Cromer to Happisburgh. There is very little permanent backshore along this shoreline, and in places no backshore is present. The beach rests on a clay platform and occasionally this is exposed and subject to marine erosion.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.5 and 9.2 respectively within Volume 3.

#### Historic Environment

There are only a few listed monuments along the coastal strip. The pillboxes which stood along the cliff edge have now mostly been lost through cliff erosion; in places their remains are still present on the beach. Ostend House at Walcott is recorded as a building (but not listed) in the SMR database (HER no. 36222). Historical features within this policy unit have been presented on Figures 10.3 to 10.4 within volume 3.

#### Population

Bacton and Walcott are small settlements along this coastal stretch, which contain both residential and commercial properties. The beach is the main recreational attraction. There is a number of holiday developments and associated amenities spread along the main coastal road, the B1159, which runs along the coastal strip. There are also cliff top caravan sites at Bacton. To the south of Ostend and behind the villages is Grade I agricultural land.

### 6.9.12

#### *Policy Unit 6.12 – Ostend to Eccles*

Along this policy unit there are unconsolidated cliffs, which increase in height towards Happisburgh. The beaches are predominately sandy, but there is occasionally shingle exposed in low runnel features. The sand forms a relatively thin layer on top of a clay platform. This is occasionally exposed, particularly during storm events.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.5 and 9.2 respectively within volume 3.

#### Historic Environment

A number of monument sites have already been lost due to cliff erosion, including a pillbox, battery and a well. There are two Grade II listed buildings at Happisburgh: Hill House Hotel (HER no 18473) and Happisburgh Manor (St Mary's) (HER no. 14148). The gardens of the latter are also registered in the historic gardens register (Site no. 35169). St Mary's church is listed as a Grade I property (HER no. 7091). A flint axe was also discovered at the north end of Happisburgh beach which is considered to be a highly important find which could provide an insight into man's early history in Europe. Other historical features within this policy unit have been presented on Figure 10.4 within Volume 3.

#### Current and future land use

Happisburgh is a small village whose main centre is set back approximately a hundred metres from the cliff edge. It includes the Grade 1 St Mary's Church, which is both a heritage feature and of community value. There is a cliff top caravan park fronting the main village and a road of

both holiday and residential properties extend to the cliff edge; a number of properties have already been lost due to cliff erosion in recent years. There is access to the beach via steps, but these are a temporary response to recent cliff erosion along this frontage. The RNLI access point is currently not accessible and the crew now launches at Cart Gap.

### 6.9.13

#### *Policy Unit 6.13 – Eccles, Winterton Beach Road*

Along this frontage there is a narrow strip of foredunes which back a mainly sandy beach. The backshore is very narrow and is absent in places. However, between Eccles and Waxham there is a wider backshore and foreshore due to beach management works. There is a vast low-lying hinterland, which is potentially at risk from flooding. The beach cover is thin and occasionally erosion has resulted in exposure of the underlying clays and subsequent down cutting. At Winterton Ness there is an extensive sand dune complex, which backs a sandy beach. The ness is known to fluctuate in position. The beach is wide and sandy, but the foreshore is steeply dipping.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.6 and 9.2 to 9.3 respectively within Volume 3.

#### Historic Environment

Along the immediate coastal strip there is a large number of a monument site, but none that have been identified as high importance. There is only one Scheduled Monument in this area; the site of a manorial complex at Hall Farm, Waxham.

The Broadlands area does, however, include a significant number and variety of sites many of which are identified as high importance. The drainage mills are an important part of the industrial archaeology of the Broads. There were once 240 of them in the Broads, but now only 72 survive, ten of which are between Happisburgh and Winterton (Halcrow 2002).

There is a number of Grade II\* listed properties including: Horsey Mill (HER no. 8408); All Saint's Church, Horsey (HER no 8411); St John's Church, Waxham (HER no 8372); Waxham Hall (HER no. 8248); St Margaret's Church, Sea Palling (HER no. 8381) and St Andrew's Church, Hempstead (HER no. 8379); St Mary's Church, Hickling (HER no. 8393) and Heigham Holes windpump (HER no. 8392).

In addition there is a number of Grade II listed properties: Brograve Mill, Sea Palling (HER no. 8389); Lambridge Mill, Sea Palling (HER no. 8374); Beach Farm (HER no. 36513); wall at Church Farm (HER no.30680); Little Manor, Hempstead (HER no. 36514); Ling's Mill, Catfield (HER no. 8396); Stubb Mill (HER no. 8391); Martham Ferry (HER no. 33880) and a large number of windpumps (HER nos. 8373, 8409, 8547, 35364).

There are two Scheduled Ancient Monuments within the Broadlands area covered by the SMP: Hickling Priory (Monument number: 30625) and potter Heigham Bridge (Monument number: NF169). Hickling Priory includes standing and buried remains of a medieval priory, which are situated on a slight rise above the marshland (there was no data available for Potter Heigham Bridge).

Part of the village of Potter Heigham is a designated Conservation Area; it is the only coastal Conservation Area amongst a total of 79 in North Norfolk.

Historical features along this policy unit have been presented on Figures 10.4 to 10.5 within Volume 3.

#### Population

There are a number of villages and individual farms immediately behind the seawall. Eccles is a small settlement which predominantly includes the Bush Estate; a residential housing development. Sea Palling is a popular resort and as well as residential properties it features holiday accommodation, camping and caravan sites. There are also tourist facilities including pubs, restaurants and cafes as well as amusement arcades. As well as the tourist attractions, the beach, and its easy access, is a key draw to the area and has recently been awarded the Blue Flag award. There are also launch facilities for pleasure craft and an IRB station.

Waxham is a small residential hamlet to the south; both Waxham and Sea Palling feature historic churches, which have both heritage and community value.

There are also beach access points at Cart Gap, Sea Palling, Warren Farm and Horsey Corner, with a few additional beach access gaps elsewhere along this low-lying coast.

The boundary of the Broads extends beyond the landward limit of this SMP and is tightly drawn around the flood plains and lower reaches of the three main rivers; The Bure, Yare and Waveney. Encompassing an area of 303km<sup>2</sup> (draft Broads Plan 2004, Broads Authority Website), the Broads is Britain's largest nationally protected wetland. The Broads is also one of Europe's most popular inland waterways and attracts more than a million visitors a year; it has been estimated that in 1998 the value of tourism in the Broads represented nearly 10% of tourist spend in East of England (Broads Authority Website). The area supports a number of activities including canoeing, walking, cycling and angling. There is a number of villages and isolated farms within the Broads area, which include both residential properties and holiday accommodation. Associated with these villages there is a complex network of roads and services.

#### 6.9.14

##### *Policy Unit 6.14 – Winterton to Scratby*

Between Winterton and Hemsby, there is wide dune system, which is backed by low relict cliffs. A low area known as the Valley separates these two morphological elements. This low area becomes reduces in width to the south. Towards the south the dunes are narrow and become replaced by unconsolidated cliffs up to 15m high; which are mud-dominated. The backshore beach is wide and sandy, but the foreshore is steeply dipping.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.7 and 9.3 respectively within Volume 3.

##### Historic environment

There are few monuments records along this stretch and some registered have already been lost through coastal erosion. The historical features within this policy unit have been presented on Figures 10.5 to 10.6 within Volume 3.

##### Population

Winterton is a coastal village, which features mainly residential properties and shops, but also has some tourist accommodation. The Winterton Valley Estate, to the south, provides self-catering static holiday accommodation. The key attraction is the tranquillity and naturalness of the dunes and the beach. Recreational walkers and ornithologists are also attracted here by important birdlife.

There is a beach access and car park within the dunes; however the coastguard station was removed in Winter 2004/4 due to the erosion of the dunes.

At Newport and Hemsby the key purpose of the coastal strip is as a tourist destination. There is a number of amusement arcades and pubs and restaurants running down to the coast. The Pontins Holiday centre at Hemsby, which consists of a comprehensive range of on-site facilities and entertainment, is an important contributor to the economy of the Borough. The beach is an important attraction and is easily accessed at this location. There is also an IRB station, which serves this beach. Along the coastal strip there are both residential and holiday cottages and holiday developments.

#### 6.9.15

##### *Policy Unit 6.15 – California to Caister-on-Sea*

Along this policy unit there are a sandy beach is backed by unconsolidated cliffs up to 15m high; at California there is a higher proportion sands than to the north. The cliffs rapidly reduce in height to the south of California.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.7 and 9.3 respectively within Volume 3.

### Historic Environment

There are few monuments records along this stretch and some registered have already been lost through coastal erosion. The historical features within this policy unit have been presented on Figure 10.6 within Volume 3.

### Population

These two settlements include both residential and holiday accommodation and there are also recreational and leisure facilities. The main tourist accommodation centres are Beach Road Chalet Park at Scratby and California Cliffs Caravan Park at California. There is access to the beach at California Gap.

There is also a short stretch of agricultural land between California and Caister-on-Sea.

## 6.9.16

### *Policy Unit 6.16 – Caister-on-Sea*

Within this policy unit the cliffs are replaced by a low lying dune ridge which forms and gently rising hinterland. The beaches are narrow along this section but construction of groynes and reefs at Caister have resulted in wide beaches at this point, but the beach cuts back immediately south of the reefs. The beach widens again towards the lifeboat station, where there is an accumulation of material at Caister Point, forming a small ness feature. The beaches are predominantly sandy, but there is a veneer of shingle around mean high water.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.7 and 9.3 respectively within Volume 3.

### Historic Environment

There are few monuments records along this stretch and some registered have already been lost through coastal erosion. The historical features within this policy unit have been presented on Figure 10.6 within Volume 3.

### Population

Caister is a coastal town, which supports, particularly along the seafront, a large number of holiday properties and holiday developments, including large caravan parks. The main tourist accommodation centres are the Haven Holidays Chalet Park and Silver Sands Holiday Village. The main commercial centre is several hundred metres inland and features both tourist facilities and local businesses. There are car parks to both the north and south of the town, with a number of beach access points along the frontage. There is also an IRBB station on the seafront.

## 6.9.17

### *Policy Unit 6.17 – Great Yarmouth*

Within this policy unit dunes front a low lying hinterland, these are currently accreting, but are relatively low in form. This system reduces in size to the south, and at the Pleasure Beach there is very little dune development, probably due to human pressure, but the dunes become more substantial again towards the south, where access to the beach is more restricted. The sandy beach is wide and flat, but the backshore narrows towards the south.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.8 and 9.3 respectively within Volume 3.

### Historic environment

Great Yarmouth has a recorded history going back to AD 1000 when it expanded as a seasonal fishing settlement. It grew quickly and by the early 14<sup>th</sup> century was ranked fifth in wealth amongst English towns. Although the Borough contains 13 Scheduled Monuments (SAMs), none are located along the coastal strip: Norfolk Square (HER no. 15105), part of which is graded by the Norfolk Historic gardens Survey as two-star (regional importance), and Venetian Waterways (HER no. 33470), which are public seafront gardens graded by the Norfolk Historic Gardens Survey and a grade three-star (national importance).

Along the coastal strip there are seven Grade II properties: Wellesley Road Strand (HER no. 34128), Empire Theatre (HER no. 31612), St John's Church (HER no. 4337) the Maritime Museum (HER no. 34308), Windmill Theatre on Marine Parade (HER no. 12028), Wellington Arch (HER no. 17756) and Winter Gardens (HER no. 12029).

The Hippodrome (HER no. 34307) is listed as Grade II and Norfolk Pillar (or Nelson's Monument) (HER no 4302) is listed as Grade I.

The Scenic Railway fairground ride at the Pleasure Beach is recorded within the SMR (HER no. 37382), because it is one of the oldest wooden examples still in use, but is not of listed status.

The historical features within this policy area have been presented on Figures 10.6 to 10.7 within Volume 3.

#### Population

Great Yarmouth is a large seaside town and is Norfolk's largest resort featuring a wide range of tourist attractions; it is one of the most popular tourist attractions on the east coast of England. There is a number of car parks along the frontage and various beach access points. The promenade is a key attraction and is known as The Golden Mile with its many facilities including two piers, bowling greens, sea life centre and amusement arcades. This is supplemented by the piers, Wellington Pier and Britannia Pier, and the Pleasure Beach Fun Fair. The beach also remains a key tourist feature. Other attractions include the Race Course and Golf Course at North Denes. There are numerous seafront hotels and holiday accommodation.

As well as being a tourist centre, the town performs both a commercial and residential function and is second only to Lowestoft, in terms of population, within the SMP area.

The port of Great Yarmouth is a fully-functioning port and the turnover during the last five years has been generally constant in the range of £4 to £4.5 million (GYPA website). Since the decline of the fishing industry, Great Yarmouth has become a major base for the offshore exploration for oil and gas and is the principal UK base for the offshore oil and gas industry in the Southern North Sea. A deepwater harbour has been constructed and is now in operation within this policy unit, this will allow fast ferries to service Great Yarmouth.

In terms of the other infrastructure the beach road is a key link for tourist attractions along the promenade and part of the local road network. This runs along the back of the promenade.

### 6.9.18

#### *Policy Unit 6.18 – Gorleston*

Along this policy unit there are unconsolidated cliffs reach heights of between 10 and 15m, but these have been regarded as grassed behind the seawall. There is a narrow predominantly sandy foreshore, but a wide, flat backshore at the northern end, which narrows considerably towards the south.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.9 and 9.4 respectively within Volume 3.

#### Historic environment

There are two Grade II buildings at Gorleston: Gorleston Pavilion (HER no. 17974) and Old Gorleston Lighthouse (HER no. 10585). There is also a number of monuments classified within the SMR, but none are identified as high importance. The historical features within this policy unit have been presented on Figure 10.8 in Volume 3.

#### Population

The Blue Flag Beach at Gorleston-on-Sea is a key attraction and activities include bathing, windsurfing, yachting and jet skiing. There is also a number of beach-side shops. On the cliff top there is a number of additional tourist attractions including gardens, bowling greens and tennis courts. The resort also has its own theatre, nightspot, a casino, bingo hall, pitch and putt, golf course and amusement park. There is a range of holiday accommodation. Gorleston also has a substantial residential area, with a number of cliff top properties, and supporting community facilities.

In addition to the usual infrastructure features, there is a pumping station and sewer. Car parks are situated to the north and south of the seafront, but there is a number of pedestrian beach access points down the cliffs.

#### 6.9.19

##### *Policy Unit 6.19 – Goreston to Hopton*

There are unconsolidated cliffs that reach heights of between 10 and 15m; the cliffs have been regarded and grassed behind the defences. There is a narrow predominantly sandy foreshore. Where a backshore is present there is commonly shingle present. The beach height varies along the frontage and is greater along the southern end.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.9 and 9.4 respectively within Volume 3.

##### Historic environment

There are a few monuments along this frontage, but none have been identified as high importance. The historical features within this policy unit have been presented on Figure 10.8 within Volume 3.

##### Population

Between Gorleston and Hopton is the Gorleston Golf Course, which extends up to the cliff edge. The village of Hopton is also a popular holiday destination; here there is a cliff top caravan park, the Hopton Holiday Village, which fronts the village of Hopton. For much of the frontage the main residential and commercial properties of Hopton are a couple of hundred metres inland from the cliff edge. To the south of the Holiday Village there is a number of properties close to the cliff edge.

#### 6.9.20

##### *Policy Unit 6.20 – Hopton*

Within this policy unit there are unconsolidated cliffs reach heights of between 10 and 15m. There is a narrow predominantly sandy foreshore. Where a backshore is present there is commonly shingle present.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.9 and 9.4 respectively within Volume 3.

##### Historic environment

There are a few monuments along this frontage, but none have been identified as high importance. The historical features within this policy unit have been presented on Figure 10.8 within Volume 3.

##### Population

Between Gorleston and Hopton is the Gorleston Golf Course, which extends up to the cliff edge. The village of Hopton is also a popular holiday destination; here there is a cliff top caravan park, the Hopton Holiday Village, which fronts the village of Hopton. For much of the frontage the main residential and commercial properties of Hopton are a couple of hundred metres inland from the cliff edge. To the south of the Holiday Village there is a number of properties close to the cliff edge.

Between Hopton and Corton the land is used for agriculture and is classified as Grade 2 agricultural land. There is a number of informal vehicular beach access points. Towards Corton there is a cliff top holiday development, Broadlands Sand Holiday Centre.



### 6.9.21 *Policy Unit 6.21 – Hopton to Corton*

Within this policy unit there are unconsolidated cliffs reach heights of between 10 and 15m. There is a narrow predominantly sandy foreshore; where a backshore is present there is a commonly shingle present. Along the majority of this frontage, low dunes have developed in front of the cliff toe.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.9 and 9.4 respectively within Volume 3.

#### Historic environment

There is a disused MOD bunker situated along this frontage. In addition there are a few monuments along this frontage, but none have been identified as high importance. The historical features within this policy unit have been presented on Figure 10.8 within Volume 3.

#### Population

Between Hopton and Corton the land is used for agriculture and is classified as Grade 2 agricultural land. There is a single residential property and there is one vehicular beach access point that leads from Broadlands Sand Holiday Centre..

### 6.9.22 *Policy Unit 6.22 – Corton*

Within this policy unit the cliffs reach heights of over 20m. There is a predominantly sandy foreshore and the beach is extremely narrow and low in front of the sea wall along the northern two thirds of this policy unit. The southern half of the policy unit has been designated as a SSSI for geological exposure (Corton Cliffs SSSI).

The natural environment and the landscape and character along this frontage have been presented on Figures 8.9 and 9.4 respectively within Volume 3.

#### Historic environment

There are a few monuments along this frontage, but none have been identified as high importance. The historical features within this policy unit have been presented on Figure 10.8 within Volume 3.

#### Population

Corton village is a popular holiday centre and holidaymakers swell the village population by more than 600 per week in the summer. There are two holiday villages in Corton, which are situated along the cliff top, and a number of associated facilities. The beach and the proximity of the Nature Reserves of Corton Woods and Gunton Warren is a key attraction. The beach and Gunton Warren are both popular for recreation and tourism. There are three main beach access points at Baker's Score, Tibbenham's Score and Tramps Alley. As well as tourist facilities there are also a few local businesses, which serve residential properties.

To the south of Corton, inland of Gunton Warren and approximately 300m from the cliff edge, is New Pleasurewood Hills Family Theme Park, which is one of East Anglia's premier amusement parks.

### 6.9.23 *Policy Unit 6.23 – Corton to Lowestoft*

Within this policy unit the cliffs become set inland by several metres and are fronted by a beach and dune system. The beach material becomes slightly coarser towards Lowestoft and the beach is higher than at Corton. The coastal land has been designated as along this frontage has been designated as a County Wildlife Site (CWS).

The natural environment and the landscape and character along this frontage have been presented on Figures 8.9 and 9.4 respectively within Volume 3.

#### Historic environment

Much of the SMR information for this area is related to single finds of unknown or low significance; the main areas of interest are the edge of the medieval area of Lowestoft and the area of multi-period activity between Corton Church and the sea, which indicate medieval and earlier settlement (Suffolk County Archaeologists, pers. Comm.). The historical features within this policy unit have been illustrated on Figures 10.8 to 10.9 within Volume 3.

#### Population

The majority of the unit between the B1385 and the coast is dominated by a dune system; however there are a few residential properties in the south of this policy unit approximately 200m from the coast. The CWS along this policy unit is popular with tourists and provides a recreational area for the local population. There is an Eleni V oil dump situated close to the frontage within this policy unit which if allowed to erode could have detrimental impacts on local water quality.

#### 6.9.24

##### *Policy Unit 6.24 – Lowestoft North (to Ness Point)*

Along this policy unit there is a cliff line set some distance inland, but the hinterland backing the shoreline is low-lying. The beaches comprise a higher proportion of shingle than those to the north. At Lowestoft this hinterland has been significantly modified and little of the original morphology remains. Beach levels along this policy unit are affected by changes in off shore sand banks. Currently the beach is moderate but eroding to the north and depleted on the southern end of this unit. Lowestoft Ness is no longer recognisable as a 'ness' feature and the entire area has been built upon and artificially maintained.

The natural environment and the landscape and character along this frontage have been presented on Figures 8.9 and 9.4 respectively within Volume 3.

#### Historic environment

The high street conservation areas contains a number of important historical sites including a number of old net stores, net drying racks and smoke houses which preserve the towns past links to the fishing industry.

The historical features within this policy unit have been illustrated on Figures 10.9 within Volume 3.

#### Population

Lowestoft is the largest town within the SMP area and extends beyond the boundary of this SMP study area. It is important both as commercial and tourist centre. To the south of the harbour which falls outside the SMP area most of the tourist attractions, facilities and accommodation are located close to the coast, as the beach remains the key attraction. The town is also famous because Lowestoft Ness is Britain's most easterly point, as marked by the Euroscope, which is also the southern boundary for of the SMP. In the south of the policy unit there is light industry, an office block and wind turbine. In the centre of the policy unit, the low lying land behind the seawall is the disused Denes camping and caravan site, now a public space, a maritime museum and a few residential properties. The northern section of this unit is the Denes Oval Recreation Ground, historical landfill site and a gravel car park. There are the usual infrastructure features, but in addition there is a sewage pumping station and head works, together with sewage rising mains and treated water return pipes. At Ness Point, there is a gas mains and gas holder. There is a number of car parks along the frontage and various beach access points.

# 7 Key Issues

## 7.1 Introduction

This chapter identifies the key issues for each of the policy units along the SMP area. The key features and importance have been taken from the 2006 version of the Kelling to Lowestoft Ness SMP, Issues and Objectives Evaluation document.

For each of the 24 policy units the following has been presented.

### Key Features and associated issues

This is defined as something that provides a benefit or service to society in one form or another. It also identifies all issues associated with that feature. Issues may occur where either a feature is at risk from flooding or erosion or where management intervention could impact upon a feature.

### Why is the feature important?

For those features and issues which have been identified for each policy unit, this column identifies the tangible benefits of the feature

Table 7.1: Key features and issues within policy unit 6.01 Kelling Hard to Sheringham

Policy Unit	Key features and associated issues	Why is the feature important
6.01 – Kelling Hard to Sheringham	<b>Cliff top residential properties at Weybourne</b> – Potential loss of housing through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss.	Homes for people – represents substantial investment for individual property owners
	<b>Weybourne Priory</b> – Loss of the Priory to erosion, potential loss of unexcavated remains alongside the Priory which will be at risk through continuing erosion.	The Priory is a Scheduled Ancient Monument and remains may be of significant importance
	<b>Heritage Sites</b> – Loss of a number of monument sites of high importance	Sites identified as high heritage value due to their unique nature
	<b>Agricultural Land</b> – Potential loss of Grade 3 land through erosion (much of the National Trust land is in Stewardship/set aside).	Economy / employment through farming
	<b>Weybourne Cliffs SSSI</b> – Continual erosion of cliffs necessary to maintain a clear face for geological study	Contribution to understanding of national geological succession
	<b>Kelling Hard County Wildlife Site</b> – Loss of CWS site designated as unimproved, slightly calcareous and neutral grassland	Important habitats site
	<b>Beach Lane County Wildlife Sites</b> – Loss of shingle beach which protects areas of grassland, reedswamp and brackish lagoons which have County Wildlife Status	Important habitats site
	<b>Beach and Foreshore</b> – Concern over beach condition, dredging of offshore banks for aggregate – concern about potential impact on beach levels	Important recreational feature
	<b>Car park and beach access at Beach lane</b> – Potential loss of car park and potential loss of access to the beach	Tourist and local parking facilities. Provides access for local fishing industry, residents, tourists, maintenance contractors & emergency services.
	<b>Sheringham Golf Links</b> – Loss of golf course through erosion	Provides recreation and tourist facility
	<b>National Trail</b> – potential loss of Trail through erosion	Part of national network of trails, important for recreation and tourism.
	<b>AONB</b> – the way in which the coastline is managed may have an adverse effect on the landscape which contributes to this status.	High landscape value

Table 7.2: Key features and issues within policy unit 6.02 Sheringham

Policy Unit	Key features and associated issues	Why is the feature important
6.02 Sheringham	<b>Residential Properties</b> – Potential loss of housing through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss	Homes for people – represents substantial investment for individual property owners
	<b>Commercial Properties</b> – Potential loss of business through erosion	Local economy, community cohesion, investment of individual business owners, social inclusion
	<b>Community Facilities</b> – Potential loss of community facilities through erosion	Benefit to local residents, community cohesion and social inclusion
	<b>Heritage Sites</b> – Loss of heritage sites including the Lees and Beeston Regis Hill, which are of high importance	Sites identified as high heritage value due to their unique nature.
	<b>Recreational and Tourist Facilities</b> – Potential loss of tourist and recreational sites, accommodation and activities including major attractions, shops, public open space, holiday amenities and the promenade.	Tourism forms the main part of the local economy, local residents also benefit from the site.
	<b>Infrastructure</b> – Potential loss of or damage to services and roads and a sewage pumping station through erosion	Services and facilities for the local business and resident communities and transportation linkages within Sheringham  Sewage pumping station serves the whole of Sheringham, Upper Sheringham and Weybourne.
	<b>Lifeboat Station</b> – Potential loss of access and potential loss of buildings	The lifeboat is a vital part of the RNIL complement of boats providing lifesaving services around the coast of the UK.
	<b>Beeston Cliffs SSSI</b> – Continual erosion of cliffs necessary to maintain a clear face for geological study, erosion or regarding could reduce the area of unimproved grassland on the cliff-top, which is also part of the SSSI through its characteristic plant species.	Contribute to understanding of national geological succession and host to nationally important plants
	<b>Beach and Foreshore</b> – Potential deterioration in condition of Blue Flag beach, potential for a health and safety hazard caused by deteriorating defences at the foot of cliffs, degrading of offshore banks for aggregate – concern about potential impact on beach levels (non-policy issue)	Important recreational feature of the town which brings in money into the local economy.
	<b>National Trail</b> – Potential loss of Trail through erosion	Part of the national network of trails important for recreation and tourism
	<b>Access to the Beach</b> – Potential loss of access to the beach	Provides access for local fishing industry, residents, tourists, maintenance contractors & emergency services.

Table 7.3: Key features and issues within policy unit 6.03 Sheringham to Cromer

Policy Unit	Key features and associated issues	Why is the feature important
6.03 Sheringham to Cromer	<b>Cliff top properties at East Runton</b> – Potential loss of housing through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss	Homes for people – represents substantial investment for individual property owners
	<b>Cliff top caravan parks</b> – Loss of cliff top caravan parks sited on eroding cliffs, loss of investment on part of local businesses	Tourist accommodation, local economy.
	<b>Heritage Sites</b> – Loss of heritage sites including a couple identified as high importance	Sites identified as high heritage value due to their unique nature
	<b>Agricultural Land</b> – Potential loss of Grade 3 land through erosion	Economy / employment through farming
	<b>Cliffs at West Runton and East Runton</b> – Continual erosion of the SSSI designated cliffs necessary to maintain a clear face for geological study and re-sampling	Nationally important SSSI Pleistocene reference site. Internationally important site with respect to its vertebrate faunas. Contribution to understanding of national geological succession.
	<b>Car park and beach access</b> – Potential loss of car park and potential loss of access to the beach	Tourist and local parking facilities. Access to the beach provides access for local fishing industry, residents, tourists, maintenance contractors & emergency services
	<b>Beach and Foreshore</b> – Loss of Country Wildlife site, potential deterioration in condition / appearance of beach, dredging of offshore banks for aggregate – potential impact on beach level, continuing maintenance necessary for existing concrete defences at foot of cliff, potential health and safety hazard caused by deteriorating defences at foot of cliffs, West Runton SSSI includes the foreshore – designation requires continued erosion to keep exposures clean.	County Wildlife site is important for local nature conservation, the beach is an important recreational feature. West Runton SSSI is a nationally important Pleistocene site which contains the only rock pool sites in East Anglia.

Table 7.4: Key features and issues within policy unit 6.04 Cromer

Policy Unit	Key features and associated issues	Why is the feature important
6.04 Cromer	<b>Residential Properties</b> – Potential loss of housing through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss	Homes for people – represents substantial investment for individual property owners.
	<b>Commercial Properties</b> – Potential loss of business through erosion, loss of investment on part of individual business owners	Local economy, community cohesion, social inclusion and investment of individual business owners

Policy Unit	Key features and associated issues	Why is the feature important
	<b>Commercial Properties on the Promenade</b> – Potential loss of businesses through erosion or repeated flooding	Local economy, community cohesion, social inclusion and investment of individual business owners. Defines the character of Cromer.
	<b>Heritage Sites</b> – Potential loss of important monuments and Grade II listed properties of Cromer Baptist Church and 'The Gangway', Grade I listed Cromer Church. The promenade and sea wall are also listed structures.	Heritage value and community cohesion, sea defence.
	<b>Community Facilities</b> – Potential loss of community facilities through erosion	Benefit to local residents, community cohesion and social inclusion.
	<b>Recreational and tourist facilities</b> – Potential loss of tourist and recreational sites, accommodation and activities including major attractions, shops, holiday amenities, public open space and promenade.	Tourism forms the main part of the local economy. Sites also of benefit to local residents.
	<b>Pier</b> – Inappropriate management of beach and nearshore zone could jeopardise stability of pier and/or access to the pier	Tourism forms the main part of the local economy – Pier is an important tourist attraction and leisure facility. The Pier is also an important heritage feature and adds character to the town and is one of the few reviving piers in the country.
	<b>Lifeboat Station</b> – Potential loss of access and potential loss of building	The lifeboat is a vital part of the RNLI complement of boats providing lifesaving services around the coast of the UK
	<b>Infrastructure</b> – potential loss of or damage to services and roads through erosion and the promenade contains a sewage pumping station	Services and facilities for the local business resident communities and Transportation linkages within Cromer
	<b>Main Road at Cromer (A149)</b> – Potential loss of the main A road through erosion	Provides local access within Cromer to properties and businesses as well as providing main links to adjacent towns along the coast.
	<b>Sea Wall</b> – Conserving the sea wall as a Grade II listed structure, which may restrict the options for its maintenance, repair or replacement	Historical value
	<b>Beach and Foreshore</b> – Potential deterioration in condition and appearance of the Blue Flag beach, potential health and safety hazards caused by deteriorating defences at foot of cliffs and dredging of offshore banks for aggregate – concern about potential impact on beach levels (non-policy issue)	Important recreational feature of the town which forms part of the tourism economy.
	<b>Access to the beach</b> – Potential loss of beach access	Provides access to local fishing industry, residents, tourists, maintenance contractors and emergency services.

Table 7.5: Key features and issues within policy unit 6.05 Cromer to Overstrand

Policy Unit	Key features and associated issues	Why is the feature important
6.05 Cromer to Overstrand	<b>Royal Cromer Golf Course</b> – Potential loss of golf course through erosion	Provides a recreation and tourist facility and contributes to the local economy
	<b>Cliffs</b> – Loss of SAC designated site, continued erosion of cliffs necessary to maintain habitats	Critical habitat and landscape, international community.
	<b>Cliff-top footpath</b> – Potential loss of footpath through erosion	Important for recreation and tourism
	<b>Beach and Foreshore</b> – Potential deterioration in condition and appearance of the beach and dredging of offshore banks for aggregate – concern about potential impact on beach levels (non policy issue)	Important recreational feature of the town, indirectly benefits the local economy.
	<b>AONB</b> – the way in which the coastline is managed may have an adverse effect on the landscape which contributes to this status.	High landscape value

Table 7.6: Key features and issues within policy unit 6.06 Overstrand

Policy Unit	Key features and associated issues	Why is the feature important
6.06 Overstrand	<b>Residential properties</b> – Potential loss of housing within the village through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss.	Homes for people – represents substantial investment for individual property owners
	<b>Commercial Properties</b> – Potential loss of businesses through erosion	Local economy, community cohesion, social inclusion and investment of individual business owners.
	<b>Heritage Sites</b> – Potential loss of heritage sites including 2 Grade II properties: 'The Pleasance' (including Lutyens buildings) and 'Sea Marge'. Also general historical value due to connections with Sir Winston Churchill	Heritage value as listed building.
	<b>Community facilities</b> – Potential loss of community facilities through erosion	Benefit to local residents, community cohesion and social inclusion
	<b>Tourist Facilities including the Promenade</b> – Potential loss of recreation sites, including Jubilee Playground, and amenities	Tourism forms the main part of the local economy, sites also benefit to local residents
	<b>Infrastructure</b> – Potential loss of or damage to services and roads through erosion, pumping station and a storage tank sewer which is located under the corner of Pleasance garden.	Services and facilities for the local business and resident communities, transportation linkages within Overstrand. The pumping and sewers serve Overstrand and Sidestrand
	<b>Overstrand Sea Front County Wildlife Site</b> – Potential loss of habitat	Local nature conservation



Policy Unit	Key features and associated issues	Why is the feature important
	<b>Access to the Beach</b> – Potential loss of access to the beach	Provides access for local fishing industry, residents, tourists, maintenance contractors and emergency services
	<b>Car park on cliff top</b> – Potential loss of car park	Tourist and local parking facilities

**Table 7.7: Key features and issues within policy unit 6.07 Overstrand to Mundesley**

Policy Unit	Key features and associated issues	Why is the feature important
6.07 Overstrand to Mundesley	<b>Residential properties in Sidestrand</b> – Potential loss of housing within the village through erosion, devaluation of neighbouring properties, anxiety and stress to owners and occupiers facing loss	Homes for people – represents substantial investment for individual property owners.
	<b>Residential properties at Trimingham</b> – Potential loss of housing within the village through erosion, devaluation of neighbouring properties, anxiety and stress to owners and occupiers facing loss	Homes for people – represents substantial investment for individual property owners.
	<b>Community facilities</b> – Potential loss of Trimingham church through erosion	Benefit to local residents, community cohesion
	<b>MOD communications facility</b> – Potential loss of MOD mobile communications facility	Communications base
	<b>Coastal Road at Trimingham</b> – Loss of coastal road through erosion	Local access within village to properties, main coastal route providing link to adjacent towns.
	<b>Agricultural Land</b> – Potential loss of Grade 3 land through erosion	Economy / employment through farming
	<b>Cliffs</b> – Continual erosion of SSSI designated cliffs necessary to sustain habitats and exposures, continued cliff movements to support cliff face habitat types listed within SSSI designation, potential loss of County Wildlife Site cliff and cliff top habitats	Contribution to understanding of national geological succession, soft rock cliff habitats for invertebrates, cliff top habitats
	<b>Beach and Foreshore</b> – Potential deterioration in condition and appearance of the beach, potential health and safety hazard caused by deteriorating defences at foot of cliffs and dredging of offshore banks for aggregate – concern about potential impact on beach levels (non-policy issue)	Important recreational feature, attracts tourists which then contribute to the local economy.
	<b>Access to the Beach</b> – Potential loss of access to the beach	Provides access for local fishing industry, residents, tourists, maintenance contractors and emergency services
	<b>Cliff-top caravan park at Vale Road and Mundesley Cliffs North</b> – Loss of cliff top caravan park sited on eroding cliffs, loss of considerable investment on part of local businesses	Tourist accommodation and the local economy

Policy Unit	Key features and associated issues	Why is the feature important
	<b>AONB</b> – The way in which the coastline is managed may have an adverse effect on the landscape which contributes to this status	High landscape value

**Table 7.8: Key features and issues within policy unit 6.08 Mundesley**

Policy Unit	Key features and associated issues	Why is the feature important
6.08 Maundesley	<b>Residential Properties</b> – Potential loss of housing within the village through erosion, devaluation of neighbouring property and anxiety and stress to owners and occupiers facing loss	Homes for people – represents substantial investment for individual property owners
	<b>Commercial Properties</b> – Potential loss of businesses through erosion	Local economy, community cohesion, social inclusion and investment of individual business owners
	<b>Heritage Sites</b> – Potential loss of important monument sites and Grade II listed buildings	Sites identified as high heritage value due to their unique nature or listed
	<b>Community facilities</b> – Potential loss of community facilities, including Maundesley library and Maritime Museum, through erosion.	Benefit to local residents, community cohesion and social inclusion
	<b>Infrastructure</b> – Potential loss of or damage to services and amenities through erosion. Of particular concern are the AW outfall headworks. Need to maintain access to outfall screens for Maundesley Beck	Services and facilities for the local business and resident communities
	<b>B1159 at Maundesley</b> – Potential loss of the road, which is the main thoroughfare in the town and forms the main coast road linking villages between Cromer and Caister. Loss of the cliff top section of the road would require significant diversions around the town	Important link road for both locals and tourist trade and provides local access within Maundesley to properties and businesses. Provides main links to adjacent towns along the coast.
	<b>Mundesley IRB station</b> – Potential impact on launching of the lifeboat	Forms part of chain of lifeboats providing rescue services around the coast
	<b>Beach and Foreshore</b> – The way in which the coastline is managed may have an adverse effect on the condition and appearance of the Blue flag beach and dredging of off-shore banks for aggregate – concern about potential impact on beach levels (non policy issue)	Important recreational feature of the town.

Table 7.9: Key features and issues within policy unit 6.09 Mundesley to Bacton Gas Terminal

Policy Unit	Key features and associated issues	Why is the feature important
6.09 Mundesley to Bacton Gas Terminal	<b>Maundesley Holiday Camp and Hillside Chalet Park</b> – Potential loss of tourist accommodation due to erosion, loss of considerable investment on part of local businesses, loss of heritage site at Maundesley Holiday Camp	Tourist accommodation and the local economy. Important heritage feature as it was the first purpose built camp in the UK
	<b>Heritage Sites</b> – Potential loss of Saxon Cemetery	Site identified as high heritage value due to their unique nature
	<b>Agricultural land</b> – Potential loss of Grade 1 agricultural land through erosion	Economy / employment through farming
	<b>Cliffs</b> – Continual erosion of SSSI designated cliffs to sustain habitats and exposures	Nationally important site for its extensive Pleistocene sequence
	<b>Beach and Foreshore</b> – Potential deterioration in condition and appearance of the beach and dredging of offshore banks for aggregate –concern about potential impact on beach levels (non-policy issue)	Important recreational feature
	<b>Paston Way Footpath</b> – Potential loss of footpath	Important for recreation and tourism
	<b>AONB</b> – The way in which the coastline is managed may have an adverse effect on landscape which contributes to this status	High landscape value

Table 7.10: Key features and issues within policy unit 6.10 Bacton Gas Terminal

Policy Unit	Key features and associated issues	Why is the feature important
6.10 Bacton Gas Terminal	<b>Gas Terminal</b> – Potential risk of loss or damage to the site and its plant through erosion	Important nodal point for national energy infrastructure and provides local employment
	<b>Cliffs</b> – Continual erosion of SSSI designated cliffs to sustain habitats and exposures	Nationally important site for its extensive Pleistocene sequence.

Table 7.11: Key features and issues within policy unit 6.10 Bacton, Walcott and Ostend

Policy Unit	Key features and associated issues	Why is the feature important
6.11 Bacton, Walcott and Ostend	<b>Residential properties</b> – Potential loss of housing within the village through erosion, devaluation of neighbouring property and anxiety and stress to owners and occupiers facing loss	Homes for people – represents substantial investment for individual property owners
	<b>Commercial properties</b> – Risk of flooding to businesses along the coast road	Local economy, community cohesion, social inclusion and investment of individual business owners.
	<b>Cliff-top caravan parks at Bacton</b> – Potential loss of cliff-top caravan parks due to erosion, loss of considerable investment on part of local businesses	Tourist accommodation and the local economy
	<b>Holiday and residential properties at Ostend</b> – Potential loss of cliff-top properties due to erosion, loss of considerable investment on part of local businesses	Tourist accommodation and the local economy
	<b>Heritage site</b> – Potential loss of Ostend House	Heritage interest as noted in SMR register
	<b>B1159 at Walcott</b> – Potential damage to or loss of road through erosion and flooding of the road through overtopping and spray	Strategic emergency access to Bacton Gas Terminal and transportation linkages between adjacent towns and villages along the coast
	<b>Access to the beach</b> – Potential loss of access to the beach	Provides access for local fishing industry, residents and tourists, maintenance contractors and emergency services
	<b>Beach and foreshore</b> – Potential deterioration in condition and appearance of the beach and dredging of offshore banks for aggregate – concern about potential impact on beach levels (non-policy issue)	Important recreational feature.

Table 7.12: Key features and issues within policy unit 6.12 Ostend to Eccles

Policy Unit	Key features and associated issues	Why is the feature important
6.12 Ostend to Eccles	<b>Residential properties at Happisburgh</b> – Continued loss of housing through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss, sustainability of the village community reduces with each property loss and difficulty in justification of scheme to protect properties	Homes for people – represents substantial investment for individual property owners
	<b>Cliff-top caravan park at Happisburgh</b> – Loss of cliff-top caravan parks sited on eroding cliffs and loss of considerable investment on part of local businesses	Tourist accommodation and the local economy

Policy Unit	Key features and associated issues	Why is the feature important
	<b>Heritage</b> – Potential threat to Grade I St Mary's Church and the Grade II Manor House and Hill House Hotel.  Location of the flint axe site at the northern end of Happisburgh beach which is likely to influence the views of human history within Europe.	Grade I and II Listed buildings due to national heritage interests  Important in our understanding of early European man.
	<b>Agricultural land</b> – Potential loss of Grade I land through erosion	Economy / employment through farming
	<b>Cliffs</b> – Continual erosion of SSSI designated cliffs necessary to maintain a clear face for geological study and erosion of cliffs may lead to outflanking of flood defences to the south	Important geological educational site – important part of the Anglian “jigsaw” of sites which together lead to an understanding of the sequence of glacially related events.
	<b>Access to the beach</b> – Re-establishment of access to the beach at Happisburgh following its collapse in early 2003	Ramp formerly provided access for residents, tourists, maintenance contractors and emergency services.
	<b>HM Coastguard Rescue Facility</b> – Potential loss of building through erosion	Coordination of international marine rescue
	<b>Lifeboat access</b> – Ramp at Happisburgh now derelict forcing RNLI crew to launch at Cart Gap	The lifeboat is a vital part of the RNLI complement of boats providing lifesaving services around the coast of the UK.
	<b>Beach and foreshore</b> – Potential deterioration in condition and appearance of the beach, dredging of off-shore banks for aggregate – concern about potential impact on beach levels (non-policy issue) and potential health and safety hazard caused by deteriorating defences at the foot of cliffs	Important recreational feature

Table 7.13: Key features and issues within policy unit 6.13 Eccles to Winterton Beach Road

Policy Unit	Key features and associated issues	Why is the feature important
6.13 Eccles to Winterton Beach Road	<b>The Bush Estate Eccles</b> – Potential damage / loss of housing --- concern of outflanking of concrete defences, anxiety and stress to owners and occupiers facing loss, loss of local unadopted road system and EA embargo on any further development of the Bush Estate.	Homes for people – represents substantial investment for individual property owners, tourist accommodation and restricts property risk behind the sea wall
	<b>Car parks at Cart Gap</b> – Loss or damage to car park as a result of erosion or flooding	Parking facilities for local communities and tourists
	<b>Car parks at Sea Palling and Horsey Gap</b> – Loss of or damage to car parks as a result of erosion or flooding	Parking facilities for local communities and tourists
	<b>Marram Hills CWS and Waxham Sands Holiday Park CWS</b> – Potential loss of or damage to habitats	Important coastal habitat covered by BAP targets

Policy Unit	Key features and associated issues	Why is the feature important
	<b>Access to the beach</b> – Potential loss of access through erosion or management measures and informal access through dune system reduce their effectiveness	Provides access for local fishing industry, residents, tourists, maintenance contractors and emergency services
	<b>Residential properties at Sea Palling</b> – Potential loss / damage to housing through flooding, loss of community through inundation if existing defences are allowed to deteriorate, anxiety and stress to owners and occupiers facing loss and standard of flood protection may inhibit further development.	Homes for people – represents substantial investment for individual property owners.
	<b>Commercial properties at Sea Palling</b> – Potential damage to or loss of businesses through flooding	Local economy, community cohesion, social inclusion and investment of individual business owners
	<b>Infrastructure at Sea Palling</b> – Potential for damage to or loss of services and amenities through flooding	Services and facilities for the local business and resident communities
	<b>Sea Palling IRB station</b> – Potential impact on launching of the lifeboat	Forms part of the chain of lifeboats providing rescue services around the coast
	<b>Beach and foreshore</b> – Potential loss of Blue Flag award, potential deterioration in condition and appearance of the beach and dredging of off-shore banks for aggregate – concern about potential impact on beach levels (non-policy issue)	Important recreational feature of the town.
	<b>Residential properties at Waxham</b> – Potential loss / damage to housing through flooding, loss of community through inundation if existing defences are allowed to deteriorate, anxiety and stress to owners and occupiers facing loss and standard flood protection may inhibit further development	Homes for people – represents substantial investment for individual property owners
	<b>Community facilities at Waxham</b> – Potential loss of Waxham church through erosion	Benefit to local residents community cohesion
	<b>Waxham Barn</b> – Potential risk to Grade I listed building	The barn is one of the most important historical buildings in the country
	<b>Winterton Dunes and Ness</b> – Potential loss of dune and coastal habitats due to coastal squeeze (candidate SAC site), site is also a SSSI geomorphological site and as such is dependent on coastal processes continuing: the integrity of the ness is dependent on a continuing flow of sediment from the north, loss of unique landscape, interpretation of coastal processes assumed in preparing the CHaMP for Winterton Ness and loss of the County Wildlife site and NNR	Habitat site for rare amphibians and populations of species which nest on foreshore, beach height is critical, contribution to understanding if ness geomorphology and is an AONB

Policy Unit	Key features and associated issues	Why is the feature important
	<b>Residential properties at Winterton (north of Beach Road)</b> – Potential damage to or loss of some lower lying houses through flooding, concern over reduced protection due to eroding dunes, anxiety and stress to owners and occupiers facing loss, impact on sustainability of the village community, standard of flood protection may inhibit further development, complaints from residents that windblown sand is migrating onto property (non-policy issue)	Homes for people – represents substantial investment for individual property owners.
	<b>AONB</b> – The way in which the coastline is managed may have an adverse affect on the landscape which contributes to this status	High landscape value

Table 7.13a: Key features and issues within policy unit 6.13 Happisburgh to Winterton Broads

Policy Unit	Key features and associated issues	Why is the feature important
6.13 Happisburgh to Winterton Broads	<b>Residential properties (including Villages of Hickling, Horsey, Potter Heigham, West Somerton)</b> – Potential loss/damage to commercial properties and community facilities due to inundation	Homes for people – represents substantial investment for individual property owners
	<b>Commercial properties (including Villages of Hickling, Horsey, Potter Heigham, West Somerton)</b> – Potential loss / damage to commercial properties and community facilities due to inundation	Tourism is important for local economy, local community cohesion and houses for people and is an intrinsic part of the Broadland landscape and attractions
	<b>Broadland Habitats</b> – Potential saltwater penetration of this otherwise freshwater area, loss / damage to nationally important wetland area for recreation and conservation due to wide-scale inundation of this area, changes in coastal processes resulting in biological issues on SAC, drainage of the land and deep water seepage are increasing the salinity of run-off into the River Thurne	Important freshwater systems Lowland grass and dune/dune heath land interest
	<b>Agricultural land</b> – Potential damage to or ultimate loss of land through flooding	Economy / employment through farming
	<b>Tourist related property and facilities</b> – Unrestricted flooding of the Broads area would lead to a decimation of the tourism economy of the area with loss of pubs, restaurants and boatyards	Tourism forms the main element of the local economy
	<b>Windmills and other historic buildings</b> – Loss / damage to historic properties / heritage sites due to inundation including Grade II and II* properties and monuments of high importance	Characteristic features of the Broads area, tourist attraction and regional and local environmental interests

	<b>Infrastructure</b> – Potential loss of or damage to services and roads through erosion	Services and facilities for the local business and resident communities
	<b>B1159 Coast road</b> – Potential loss of road through inundation	Vital communication route for villages between Happisburgh and Winterton
	<b>AONB</b> – The way in which the coastline is managed may have an adverse effect on the landscape which contributes to this status	High landscape value

**Table 7.14: Key features and issues within policy unit 6.14 Winterton to Scratby**

Policy Unit	Key features and associated issues	Why is the feature important
6.14 Winterton to Scratby	<b>Residential properties at Winterton</b> – Potential damage to or loss of housing through erosion, concern over reduced protection due to eroding dunes, anxiety and stress to owners and occupiers facing loss, impact on sustainability of the village community and complaints from residents that windblown sand has migrated onto property (non-policy issues)	Homes for people – represents substantial investment for individual property owners
	<b>Residential properties and Hemsby and Scratby</b> – Loss of cliff top properties through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss and sustainability of continued protection.	Homes for people – represents substantial investment for individual property owners
	<b>Winterton Valley Estate</b> – Potential loss of tourist accommodation through erosion	Provides tourist facilities – represents significant investment on the part of the owners and provides local employment
	<b>Holiday development at Hemsby</b> – Potential erosion of Hemsby Marrams which provides natural protection to the village	Provides tourist facilities – represents significant investment on the part of the owners and provides local employment
	<b>Recreation and tourist facilities at Winterton</b> – Potential damage to or loss of shops, cafes, pub and holiday accommodation through flooding or erosion	Important tourist facilities and the local economy
	<b>Tourism related property and facilities at Hemsby and Scratby</b> – Potential loss of cliff top amenities and businesses through erosion	Important tourist facilities and the local economy
	<b>CWSs</b> – Potential damage if coastal defences breached	Important habitats
	<b>Community facilities at Winterton</b> – Potential loss of community facilities through erosion	Benefit to local residents, social inclusion and community cohesion
	<b>Community facilities at Hemsby and Scratby</b> – Potential loss of community facilities through erosion	Benefit to local residents, social inclusion and community cohesion



Policy Unit	Key features and associated issues	Why is the feature important
	<b>Coastguard Station</b> – Mass movement of the ness or beach erosion could have an adverse effect on the Station	Forms part of chain of lifeboats providing rescue services around the coast and part of the national system for coordinating search and rescue at sea and other tidal waters.
	<b>Infrastructure at Winterton</b> – Potential loss of or damage to services and amenities through erosion, loss of damage to local infrastructure and loss of a number of submarine telecommunications cables through erosion	Provide services and facilities for the local business and resident communities and important local link roads
	<b>Infrastructure at Hemsby and Scratby</b> – Potential loss of or damage to services and amenities through erosion	Provide services and facilities for the local business and resident communities and important local link roads
	<b>Hemsby Marrams</b> – Potential erosion of dunes and loss of habitat	Important habitats
	<b>Beach and foreshore</b> – Potential deterioration in condition and appearance of the beach and dredging of off-shore banks for aggregate – concern about potential impact on beach levels (non-policy issue)	Important recreational feature
	<b>Access to the beach</b> – Loss of access to the beach through erosion, flood damage or management measures	Provides access for local fishing industry, residents, tourist, maintenance contractors and emergency services

Table 7.15: Key features and issues within policy unit 6.15 California to Caister-on-Sea

Policy Unit	Key features and associated issues	Why is the feature important
6.15 California to Caister-on-Sea	<b>Residential properties at California</b> – Loss of cliff top properties through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss and suitability of continued protection	Homes for people – represents substantial investment for individual property owners
	<b>Holiday developments at California</b> – Potential loss of tourist accommodation and supporting infrastructure through erosion	Tourist accommodation and the local economy
	<b>Recreational and tourist facilities</b> – Potential loss of cliff top amenities and business through erosion	Important tourist facilities and the local economy
	<b>County Wildlife Site (CWS)</b> – Potential risk of damage through erosion to heath land along cliff top	Medium conservation value habitat
	<b>Infrastructure</b> – Potential loss of, or damage to, services and amenities through erosion, loss of the promenade which houses a sewage pumping station and potential loss of local road links	Provides services and facilities for the local business and resident communities, the pumping station is a vital part of mains drainage system and the roads provide local communication links.

	<b>Beach and foreshore</b> – Potential deterioration in condition and appearance of the beach and dredging of off-shore banks for aggregate – concern about the impact on beach levels (non-policy issues)	Important recreational feature of the town
	<b>Access to beach at California Gap</b> – Loss of access to beach through erosion or management measures	Provides access for local fishing industry, residents, tourists and maintenance contractors

**Table 7.16: Key features and issues within policy unit 6.16 Caister-on-Sea**

Policy Unit	Key features and associated issues	Why is the feature important
6.16 Caister-on-Sea	<b>Residential properties</b> – Loss of properties through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss and sustainability of continued protection	Homes for people – represents substantial investment for individual property owners
	<b>Community facilities</b> – Potential loss of community facilities through erosion	Benefit to local residents, social inclusion and community cohesion.
	<b>Recreational and tourist facilities</b> – Potential loss of amenities and businesses through erosion	Tourism forms the main part of the local economy and the sites also provide benefit for local residents
	<b>Seafront holiday centres and caravan parks at Caister</b> – Potential loss of sites through erosion, including holiday properties in private ownership	Tourist accommodation and the local economy
	<b>Caister Point County Wildlife Site</b> – Potential risk of damage through erosion to heath land at Caister Point County Wildlife Site along the cliff top	Medium conservation value habitat
	<b>Caister Volunteer Rescue Site</b> – Potential impact on launching of the lifeboat	Forms part of chain of lifeboats providing rescue services around the coast
	<b>Beach and foreshore</b> – Potential deterioration in condition and appearance of the beach and dredging of off-shore banks for aggregate – concerns about potential impact on beach levels (non-policy issue)	Important recreational feature of the town
	<b>Access to beach</b> – Loss of access to the beach through erosion or management measures	Provides access for local fishing industry, residents, tourists and maintenance contractors

Table 7.17: Key features and issues within policy unit 6.17 Great Yarmouth

Policy Unit	Key features and associated issues	Why is the feature important
6.17 Great Yarmouth	<b>Residential properties</b> – Loss of properties through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss and sustainability of continued protection	Homes for people – represents substantial investment for individual property owners
	<b>Commercial properties</b> – Potential loss of or damage to businesses through erosion	Local and regional economy and investment of individual business owners
	<b>Industrial units at South Denes</b> – Viability of continued use of this part of the frontage and will form an important hinterland to the proposed East Port development	Former industrial area now somewhat neglected but which is likely to be revitalised by East Port development.
	<b>Existing Port</b> – Need to continue to operate and flooding causes operational problems	Important element of local and regional economy.
	<b>Recreational and tourist facilities</b> – Potential loss of tourist and recreation sites, accommodation and activities	Tourism forms the main part of the local economy, sites are also a benefit to the local residents and it is the east coasts most popular resort
	<b>Caravan parks at North Denes</b> – Loss of caravan parks and loss of investment on part of local businesses	Tourist accommodation and local economy
	<b>Great Yarmouth and Caister Golf Club</b> – Loss of golf course through erosion	Provides recreation and tourist facility
	<b>Great Yarmouth Race Course</b> – Loss of the race course though erosion	Provides recreation and tourist facility
	<b>Infrastructure</b> – Potential loss of or damage to services and amenities through erosion and potential loss of beach road	Provide services and facilities for local businesses and resident communities and the beach road is a key link along the promenade and part of the local road network
	<b>North Denes SSSI/SPA</b> – Integrity of the North Denes SSSI/SPA and impact of any future management regime – high vulnerability to ant disturbance by works for coastal defence	Nationally and Internationally designated site which hosts nationally important numbers of breeding little terns; includes the accreting low dune system and beach
	<b>Heritage sites</b> – Potential loss of heritage sites including monuments of high importance and Grade I,II and II* properties	Heritage value as listed buildings
	<b>Access to the beach</b> – Loss of access to beach through erosion or management measures	Provides access for local fishing industry, residents, tourist, maintenance contractors and emergency services
	<b>Beach and foreshore</b> – potential deterioration in condition and appearance of the beach which has a seaside award, dredging of off-shore banks for marine aggregate (non-policy issues) and continued accretion of dune system which cannot migrate landwards because of development	East coasts most popular resort and an important recreational feature of the town

Policy Unit	Key features and associated issues	Why is the feature important
	<b>Proposed Great Yarmouth Outer Harbour</b> – Potential for economic regeneration of the area and long term implications of this feature for the area, impact on coastal processes, perceived risk of erosion at Gorleston, Hopton and Corton and maintenance dredging implications	

Table 7.18: Key features and issues within policy unit 6.18 Gorleston

Policy Unit	Key features and associated issues	Why is the feature important
6.18 Gorleston	<b>Port entrance</b> – Need to protect structures	The pier and training wall keep open the navigation channel to the port and protect Gorleston from flooding and erosion
	<b>Residential properties</b> – Potential loss / damage to housing through flooding, loss of community through inundation if existing defences are allowed to deteriorate and anxiety and stress to owners and occupiers facing loss	Homes for people – represents substantial investment for individual owners.
	<b>Commercial properties</b> – Potential loss of, or damage to, business through erosion	Local economy, community cohesion and investment of individual business owners
	<b>Gorleston Pavilion and other heritage sites</b> – Potential loss of, or damage to, heritage sites, including Grade II Pavillion and Gorleston Old Lighthouse, due to erosion	Heritage value as listed buildings
	<b>Community facilities</b> – Potential loss of community facilities through erosion	Benefit to local residents, community cohesion and social inclusion
	<b>Recreational and tourist facilities</b> – Potential loss of tourist and recreational sites, accommodation and activities including major attractions, shops, holiday amenities, public open space and promenade	Tourism forms the main part of the local economy and the sites are also of benefit to local residents
	<b>Infrastructure</b> – Potential loss of or damage to services and amenities through erosion including pumping station and sewer	Provides services and facilities for the local business and resident communities
	<b>Beach and foreshore</b> – Potential deterioration in condition and appearance of the beach has as a Blue Flag award and dredging of off-shore banks for marine aggregate (non-policy issue)	Important recreational feature

Table 7.19: Key features and issues within policy unit 6.19 Gorleston to Hopton

Policy Unit	Key features and associated issues	Why is the feature important
6.19 Gorleston to Hopton	<b>Gorleston Golf Course</b> – Loss of golf course through erosion	Provides recreation and tourist facilities

Table 7.20: Key features and issues within policy unit 6.20 Hopton

Policy Unit	Key features and associated issues	Why is the feature important
6.20 Hopton	<b>Recreational properties</b> – Potential loss of housing through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss and viability of protecting Hopton in the longer-term	Homes for people – represents substantial investment for individual owners
	<b>Commercial properties</b> – Potential damage to or loss of businesses through flooding or erosion	Local economy, community cohesion and investment of individual business owners
	<b>Community facilities</b> – Potential loss of community facilities through erosion	Benefit to local residents, social inclusion and social inclusion
	<b>Hopton Holiday village</b> – Potential loss of tourist accommodation through erosion	Tourist accommodation local economy and individual owners
	<b>Recreational and tourist facilities</b> – Protection of tourists and recreation sites, accommodation and activities including major attractions, shops, holiday amenities, public open space and promenade	Tourism forms the main part of the local economy and the sites also benefit the local residents
	<b>Infrastructure</b> – Potential loss of or damage to services and amenities through erosion, including the promenade	Provide services and facilities for the local businesses and resident communities and the promenade is a key attraction of the resort
	<b>Access to beach</b> – Loss of access to beach through erosion or management measures	Provides access for local fishing industry, residents and tourists
	<b>Beach and foreshore</b> – Potential deterioration in condition and appearance of the beach, potential health and safety hazard caused by deteriorating defences at foot of cliffs and dredging of off-shore banks for marine aggregate and impact on beach levels (non-policy issues)	Important recreational feature of the town

Table 7.21: Key features and issues within policy unit 6.21 Hopton to Corton

Policy Unit	Key features and associated issues	Why is the feature important
6.21 Hopton to Corton	<b>Broadland Sands Holiday Centre</b> – Potential loss of tourist accommodation through erosion	Tourist accommodation, local economy and individual owners
	<b>Agricultural land</b> – Risk of loss of Grade 2 agricultural land through erosion	Economy / employment through farming
	<b>Beach and foreshore</b> – Deterioration in condition and appearance of the beach, potential health and safety hazard caused by deteriorating defences at foot of cliffs and dredging of offshore banks for marine aggregate and impact on beach levels (non-policy issue)	Important recreational feature
	<b>Access to beach at Broadland Sands</b> – Loss of access to beach through erosion or management measures	Provides access for local residents, tourists and local authority maintenance contractors
	<b>Infrastructure</b> – Potential loss of a disused treatment works and a local pumping station.	Services to local residents and businesses
	<b>MOD Bunker</b> – Potential for the loss of the supporting cliff to the MOD bunker.	Military heritage

Table 7.22: Key features and issues within policy unit 6.22 Corton

Policy Unit	Key features and associated issues	Why is the feature important
6.22 Corton	<b>Residential properties</b> – Potential loss of housing through erosion, devaluation of neighbouring property, anxiety and stress to owners and occupiers facing loss, potential loss of community cohesion through property loss, viability of protecting Corton in the longer term – concern over limited life of new defences, concern expressed by Parish Council that no compensation is payable to property owners and concern about outflanking of defences from adjoining undefended frontages	Homes for people – represents substantial investment for individual property owners
	<b>Commercial properties</b> – Potential loss of businesses through erosion, viability of protecting Corton in the longer term, concern over limited life of new defences	Local economy, community cohesion and investment of individual property owners
	<b>Community facilities</b> – Potential loss of community facilities through erosion, including Common land at Bakers Score	Benefit to local residents, social inclusion and community cohesion
	<b>Heritage sites</b> – Potential loss of area of high archaeological interest seaward of Corton Church	Area identified as high archaeological importance
	<b>Tourist facilities</b> – Protection of tourist and recreation sites, accommodation and activities	Provides facility for local community and visitors and aids the local economy

Policy Unit	Key features and associated issues	Why is the feature important
	<b>Infrastructure</b> – Potential loss of or damage to the pumping station, services and roads through erosion, including the main village street and main drainage	Provide services and facilities for local businesses and resident communities and links to adjacent towns and villages
	<b>Cliffs</b> – Erosion of cliff face needs to continue to maintain clean exposures and retain SSSI designation	Important geological educational site –type-site for the Anglian Glacial Stage
	<b>Beach and foreshore</b> – Dredging of off-shore banks for marine aggregate (non-policy issue), impact of Great Yarmouth Outer Harbour and Gorleston Reef's projects on future beach levels in front of the village, retention of specialist recreation facility and public notion that lowering beach levels in front of the village could be improved by restoring the failed groynes and potential health and safety hazard caused by deterioration defences at foot of cliffs	Important recreational feature for the town.
	<b>Access to beach at Bakers Score and Tibbenham's Score</b> – Loss of access through erosion or management measures	Provides stepped access for residents, tourists and maintenance contractors

Table 7.23: Key features and issues within policy unit 6.23 Corton to Lowestoft

Policy Unit	Key features and associated issues	Why is the feature important
6.23 Corton to Lowestoft	<b>Infrastructure</b> – Rising mains to Corton Sewage Treatment works and treated water return cross the site of Gunton Warren	The rising main and return pipe are essential infrastructure for the treatment and disposal of sewage from Lowestoft
	<b>Gunton Warren</b> – Loss of beach will threaten future of designated LNR/County Wildlife site and provides open space indicated in Local Plan as needing protection	Important dune and grassland and public amenity
	<b>Beach and foreshore</b> – Potential deterioration in condition and appearance of the beach, potential health and safety hazard caused by deteriorating groyne field, dredging of off-shore banks for marine aggregate – concern about the potential impact on beach levels (non-policy issue) and potential contamination from exposure of Eleni V oil dump	Important recreational feature and sea pollution and the coast associated with removal
	<b>Access to beach at Tramps Alley</b> – Potential loss of access through erosion or management measures, lack of beach access points along this section of the coast	Provides access for local fishing industry, residents, tourists, maintenance contractors and emergency services

Table 7.24: Key features and issues within policy unit 6.24 Lowestoft North (to Ness Point)

Policy Unit	Key features and associated issues	Why is the feature important
6.24 Lowestoft North (to Ness Point)	<b>Lowestoft commercial properties</b> – Potential loss of important industrial land and associated assets	Significant industrial land use, infrastructure assets and strategically important economic sector of the town. The area is also targeted for development under 1 <sup>st</sup> East URC.
	<b>Infrastructure</b> – Protection of sewage pumping station and headworks. Sewage rising main and treated water return pipes, gas mains and gas holder at Ness Point and potential loss or damage to local road network	Pumping station and outfall essential components of town's drainage system, Gasholder essential for energy provision, sewage pipes behind sea wall and important communication links.
	<b>Recreational and tourist facilities</b> – Potential loss of tourist and recreation sites, accommodation and activities	Tourism forms the main part of the local economy, sites are also of benefit to local residents
	<b>Lowestoft North Dunes</b> – Preservation of fishing nets heritage site, open space indicated on the Local Plan as needing protection and potential exposure for former household waste tip.	Heritage site, public amenity and sea contamination / coat of removal
	<b>Lowestoft Ness Point</b> – Maintaining the area as mainland, Britain's most easterly point	The local authority is developing the area as a tourist attraction
	<b>Beach and foreshore</b> – Deterioration in condition and appearance of the beach, potential public health and safety and navigation hazard caused by defence ruins and groyne field and dredging of off-shore banks for aggregate (non-policy issue)	Important recreational feature of the town.



# 8 Results of the assessment on the policy units

## 8.1 Introduction

This section sets out a summary of the assessment results for each of the policy units. The detailed assessment tables are presented in Table A1.2 in Appendix 1.2.

Table A1 assesses the preferred policies against the key areas for consideration as derived from the SEA Directive topics (please refer to Table 4.1). The key issues identified for each of the policy units within Chapter 7 form the basis of this assessment and are referred to within the table.

The following sets out how the results presented in the detailed assessment table (Table A.1.2) are discussed within this section.

For each policy unit the discussion has been split down into eight sections which are as follows:

- **Current situation** – describes what defences (if any) that are currently in place and their residual lives
- **Continuation of the current situation** – describes the impact on each of the policy unit if current management was to continue
- **Preferred policy** – sets out what the preferred policies are for each of the units in the short, medium and long term
- **Summary of the results of the assessment of the preferred policy** – this is a summary table of the detailed results which are presented in Appendix 1. The summary tables only present significant adverse and beneficial impacts of the preferred policies on the key areas for consideration as detailed in Chapter 4. Where negative and slight beneficial impacts have been identified these are provided in the full summary tables in Appendix 1.1. .
- **Results of the assessment of the preferred policy in the Short Term** – discussion of the impact of the preferred policies on each of the units in the short term
- **Results of the assessment of the preferred policy in the Medium Term** – discussion of the impact of the preferred policies on each of the units in the medium term
- **Results of the assessment of the preferred policy in the Long Term** – discussion of the impact of the preferred policies on each of the policy units in the long term
- **Impact on the policy unit if there were no active intervention** – describes the impact on the policy unit if there were no active intervention (for the policy units where the preferred policy is no active intervention this section has been omitted. For these policy units the alternatives are discussed in the continuation of the current situation. There are two policy units where at present there are no defences present and continue to have no active intervention policy options, for these units alternatives have been discussed by considering the implementation of defences.

Figures 2.1 to 2.10 Erosion Rates, in Volume 3 display the indicative erosion rates of the preferred policies at the three timeframes and Figures 11.1 to 11.24 Environmental Constraints in Volume 3 illustrate these with the key environmental features along the shoreline. These figures should be referred to when reading this chapter.

Table 8.0 below summarises the evaluation criteria used in this assessment, however it should be noted that this section only presents the significant adverse and beneficial impacts. Any slight adverse and slight beneficial effects identified are presented in Appendix 1.1 summary of results. For more details on the criteria please refer to Table 5.1 (Evaluation Criteria) in Chapter 5.

Table 8.0: Summary of the evaluation criteria used for this assessment.

Potential Effect	Evaluation Criteria
Significant Adverse Effect	xx
Negative Impact	*
No Impact	=
No change from the baseline situation	-
Slight Beneficial Impact	✓
Beneficial Impact	✓✓

## 8.1.1

## 6.01 Kelling Hard to Sheringham

Current situation

There are no built defences along this stretch of coastline. At Weybourne there is a shingle bank which provides local flood protection; this has a low timber palisade to the rear.

Continuation of present management

If current management were to continue cliff erosion would continue at a similar rate. In the short term there would be narrowing of the shingle bank at Weybourne as there are low sediment transport rates along this stretch of coast resulting in minimal shingle input to this frontage. The erosion of the cliffs will however contribute to beach building material helping to maintain the beaches. In the medium term it is unlikely the cliffs will be able to maintain the present beach levels. Increased sea level rise could remove more material and the beach could become narrower and steeper as the cliffs prevent landward movement. The retreat of the beach position would impact on the palisade at Weybourne and this would need to be reconstructed landward of its present location. In the long term it is likely that the palisade would need to be constructed landward at regular intervals.

If defences were to be implemented along this stretch of coast this would prevent cliff erosion which will decrease sediment supply into the system. A decrease in sediment supply coupled with low transfer rates along this frontage will result in a reduction in the beach levels and potentially a total loss of the beach by the long term.

Preferred Policy

The long term plan is to promote a naturally functioning coastline. Along this stretch of coastline there are no existing open defences and few socio-economic assets.

The proposed policy option for this stretch of coastline for the short, medium and long term is no active intervention.

Summary of the results of the assessment of the preferred policies

Table 8.1: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.01

Key areas for consideration derived from the SEA Directive topics.	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, geomorphology (coastal processes)	-	✓✓	✓✓
Historic environment and archaeology	xx	xx	xx
Physical and mental wellbeing	*	*	xx

### Results of the assessment of the preferred policy option in the Short Term

In the short term there will be a significant adverse impact on the historic environment and archaeology as some heritage sites which include a coastal monument site of high importance will be lost.

Other impacts in the short term there will be slight negative impacts on coastal activities through loss of some agricultural land this could also result in a negative impact on physical and mental wellbeing due to stress and anxiety caused by the loss of this land and the potential loss of income associated with it. No defences or measures are planned to protect the coastline from changes in sea level rise and storm surges therefore a negative effect on adapting to changes in climate has also been identified. There will be small losses to the Kelling Hard and Beach Lane County Wildlife Sites (CWS) having a slight negative effect on ecosystems and biodiversity. On the other hand as no defences are planned there will be positive effects on protected sites and species though continual erosion of Weybourne Cliffs SSSI, maintaining their exposure. The policy option will mixed impacts on AONB during this time frame. On the one hand the cliffs will be allowed to erode naturally maintaining the integrity of the Weybourne Cliffs SSSI which contributes to the character of the AONB. At present there are few defences along this section of the coast therefore implementing the NIA policy option will not affect the relationship between the land and sea within the AONB. On the other hand allowing the cliffs to erode will result in the loss of some heritage sites and the loss of parts of the two CWS which both contribute to the character of the ANOB. Table A1 - 6.01 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the significant adverse impact on the historic environment and archaeology will continue as further heritage sites will be lost including some coastal monument sites of high importance. On the other hand the lack of coastal defences in this area will mean that the beach will be maintained. This in itself will act as a natural defence from increased wave intensity and any associated flooding thus having a beneficial effect on hydrology.

Other impacts in the medium term will be further losses of farmland and some loss of the Coastguard Cottages at Weybourne. There will also be loss to the golf course land and the coastal path. This will result in further negative effects on coastal activities, particularly with regards to agricultural land and tourism and recreation, and a negative effect on material assets through the loss of property. There will be further loss to heritage sites and Kelling Hard and Beach Lane CWS. As in the short term, no intervention is planned for this stretch of coastline therefore there will be a negative impact on adapting to a change in climate. During this timeframe there will be further mixed impacts on the AONB associated with the further loss of the CWSs and heritage sites, coupled with allowing the coastline to erode naturally. Table A1 - 6.01 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

In the long term there will continue to be a significant adverse impact on the historic environment and archaeology through continued loss of the heritage sites and archaeology. The effects on physical and mental wellbeing could be slightly more pronounced as there will be total loss of the Coastguard Cottages at Weybourne resulting in a significant adverse impact. There will continue to be a beneficial impact on sediment, geology, and geomorphology (coastal processes) as the beach will continue to be maintained.

The other impacts identified in the long term are similar to those identified in the medium term. The mixed impacts on the AONB will continue, however it should be considered that the policy option for this policy unit is to allow the coastline to function. Table A1 - 6.01 in Appendix 1.1 presents a full summary of these results.

## 8.1.2

## 6.02 Sheringham

Current situation

Currently a vertically faced concrete seawall and promenade run along this section of the coastline. Groynes are also in place along this stretch with timber groynes to the east and west and concrete groynes in the central section.

Continuation of present management

If the current management were to continue, in the short term the seawall and rock revetment would hold the cliffs in their present position. There would be some reduction in the beach volume and low sediment transport into this area from the east. The rate of erosion of the cliffs would be limited by the presence of the defences. In the medium term the beaches will steepen and narrow as the defences would prevent the transition of the beach inland and there would also be a lack of feed from cliff erosion. The beach in front of the seawall to the east of Sheringham would also continually narrow. In the long term it is unlikely that a beach will be present. There would be cutback of the shoreline to both the east and the west of Sheringham meaning that the town will increasingly form a promontory.

Preferred Policy

The long term plan for Sheringham is continue to protect the assets within the town. There are low sediment transport rates along this section of the coast therefore protecting this section would not significantly impact upon adjacent shorelines.

The proposed policy option for the short, medium and long term is to hold the existing line.

**Table 8.2: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.02**

Key areas for consideration derived from the SEA Directive topics.	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	xx
Sediment, geology, and geomorphology (coastal processes)	-	x	xx
Natural landscape and seascape	-	x	xx

Results of the assessment of the preferred policy option in the Short Term

In the short term no significant adverse or beneficial impacts have been identified on this policy unit.

During this time frame the sea wall and groynes will be maintained preventing the loss of property and coastal infrastructure resulting in positive impacts on human health and physical and mental wellbeing as the maintenance of the existing defences will alleviate any anxiety and stress caused by the fear of property loss. There will be a slight negative impact on Beeston Cliffs SSSI as the maintenance of the sea defences will prevent erosion of these cliffs resulting in a poor exposure of the SSSI. Table A1 - 6.02 in Appendix 1.1 presents a full summary of these results.

Results of the assessment of the preferred policy option in the Medium Term

In the medium term no significant adverse or beneficial impacts have been identified on this policy unit.

During this timeframe the seawall and groynes will continue to be maintained continuing to contribute to a positive impact on human health as the maintenance of the defences will reduce any fear of property loss. There is the potential for a slight negative impact on the coastal activities as even though the defences will prevent the loss of any tourist infrastructure the size of the beach will be reduced. This could have an impact on visitor numbers to the area which in turn will impact on the local tourist industry and economy. The maintenance of coastal defences at Sheringham will have a negative impact on the natural landscape, however the prevention of property loss will have beneficial impacts on the built landscape and townscape. The reduced

beach will have a negative impact on coastal flooding and overtopping through reduced wave dispersion. The maintenance of the defences will also negatively impact on the sediment, geology, and geomorphology (coastal processes) and the natural coastal processes along this section of the coastline. Even though sediment transport in this area is considered to be low the defences will prevent input of sediment through cliff erosion. In the short term erosion of Beeston Cliffs SSSI will be prevented by the presence of the defences, therefore there will be a negative impact on this protected site. The hold the line policy will require defences to be replaced when they reach the end of their lifespan or upgraded to adapt to changes in the climate. This could potentially have temporary negative impacts on noise and air quality if construction is required. However replacement or upgrade of defences will have beneficial impacts on adapting to changes in climate. Table A1 - 6.02 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

In the long term the defences will continue to be maintained. This could result in a significant adverse impact on Beeston Cliffs SSSI due to poor exposure as erosion of these cliffs will be prevented. The impacts on sediment, geology, and geomorphology (coastal processes) will be more pronounced as the beach will have disappeared completely by this timeframe resulting in a significant adverse impact. A significant adverse impact has also been identified on natural landscape and seascape associated with the loss of the beach.

Other impacts identified during this timeframe will be the same as those identified in the medium term. There may also be a native localised affect on the AONB during this timeframe as a small section of AONB is located in the far west of this policy unit and the loss of the beach will impact on the relationship between the land and sea. Table A1 - 6.02 in Appendix 1.1 presents a full summary of these results.

#### Impacts on policy unit 6.02 – Sheringham if there were no active intervention

If the preferred policies were not implemented the timber groynes and seawall to the east of Sheringham would fail in the short term. The seawall and rock groynes that are in front of the town would remain in place for the majority of the short and medium term; however, they are predicated to fail in the long term. This would result in a large loss of residential and commercial properties, infrastructure, services and facilities. This would have significant adverse impacts on material assets, activities and industries and physical and mental wellbeing. There would also be impacts in surrounding towns and villages as Sheringham is a key service centre for the region.

### 8.1.3

#### 6.03 Sheringham to Cromer

##### Current situation

Currently timber groynes are present between these two locations and there is a redundant timber revetment between Sheringham and West Runton.

##### Continuation of present management

If the present management were to continue in the short term the cliffs would continue eroding at the current rate, except where the masonry walls protect the beach access points. At these locations there would be no change in the cliff position. There would be limited sediment supply both to and from this area of the shoreline, however the erosion of the cliffs will maintain the beaches in their present state. In the medium term cutback will occur where the cliffs continue to erode either side of the masonry walls at the access points resulting in them becoming isolated structures. These structures will then temporarily inhibit the movement of sediment until they become completely outflanked by the cliff erosion. In the long term, cliff erosion will continue maintaining the beaches, however there would be little shingle or sand supply from the adjacent areas due to the defences increasing the promontory of these locations either side of this policy unit.

### Preferred policy

The long term plan for this policy unit is to allow it to retreat to enable a naturally functioning system.

The proposed policy for the short, medium and long term for this stretch of coastline is no active intervention.

**Table 8.3: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.03**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	✓	✓	✓✓
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Historic environment and archaeology	=	xx	=
Physical and mental wellbeing	x	x	xx

### Results of the assessment of the preferred policy option in the Short Term

In the short term the timber groynes between Sheringham and West Runton will be allowed to deteriorate and fail and the short masonry wall at the gaps maintained. No significant adverse or beneficial impacts have been identified on this policy unit during this timeframe.

Negative impacts have been identified on physical and mental wellbeing, as farmland and some of the caravan park land will be lost which could potentially result in a loss in income. The loss of caravan park and farmland also has negative effects on coastal activities, in particular on recreation and tourism and agriculture. The loss of the car park at West Runton and partial loss of car park at East Runton will have negative impacts on material assets. As there will be no active intervention there could also potentially be a negative effect on adapting to climate change as no defences will be in place to prevent the impact of rising sea levels and storm surges. A positive impact has been identified on protected sites and species as no intervention will allow for natural processes to continue exposing West Runton Cliffs SSSI. This SSSI is a nationally important Pleistocene site as it contains the only rock pool sites within East Anglia. Table A1 - 6.03 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

During this timeframe the short stretches of masonry wall at the gaps will be allowed to fail. A significant adverse impact has been identified on the historic environment and archaeology as a heritage site of high importance will be lost.

Other impacts identified in the medium term will be the same as those identified in the short term however, the impacts of physical wellbeing, coastal activities and material assets will be more pronounced as cliff top properties at East Runton will be lost with further loss to the caravan park and farmland. Positive impacts have been identified on sediment, geology, and geomorphology (coastal processes) and coastal flooding as no active intervention will allow natural coastal processes to take place which will allow the beach to be maintained at its current size, thus acting as a natural defence. Table A1 - 6.03 in Appendix 1.1 presents a full summary of these results.

### Results of the preferred policy option in the Long Term

In the long term no defences will be present which will result in further loss of property and land leading to a significant adverse impact being identified on physical and mental wellbeing. A beneficial impact has been identified on sediment, geology, and geomorphology (coastal processes) as the beach will be maintained through continual sediment input. A beneficial impact has also been identified on protected sites and species as the loss of the defences will result in improved exposure of Beeston, West and East Runton Cliffs SSSIs.

Other impacts identified for this stretch of coastline at this timeframe are largely the same as those identified in the medium term. Table A1 - 6.03 in Appendix 1.1 presents a full summary of these results.

#### 8.1.4

#### 6.04 Cromer

##### Current situation

At present a Victorian concrete seawall and promenade back a timber groyned beach. The wall relies on a high beach in order to maintain its structural integrity.

##### Continuation of present management

If the current management were to continue in the short term the seawall would hold the cliffs in their current position, however there would be some narrowing of the beach. In the medium term the cliffs which are behind the seawall will be maintained in their current position, however those that are either side of the wall would begin to cutback producing a more prominent frontage. The beach will become much narrower and steeper due to restricted sediment supply and sea level rise. In the long term the cliffs will form a promontory and no beach would be present. A large amount of work would be required to maintain the seawalls and prevent outflanking due to cut back of the cliffs to the east and the west.

##### Preferred policy

The long term plan for Cromer is to continue to protect the assets. There are low sediment transport rates along this section of the coastline therefore maintaining the defences of this town should not have a significant impact on the adjacent shoreline.

The short, medium and long term policy options for Cromer are to hold the existing line.

**Table 8.4: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.04**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	x	x	xx
Natural landscape and seascape	-	x	xx

##### Results of the assessment of the preferred policy option in the Short Term

In the short term the seawall and groynes will be maintained resulting in little change from the current situation during this timeframe, therefore no significant adverse or beneficial impacts have been identified.

There is the potential for temporary short term negative impacts on noise and air quality where construction to replace or upgrade to the existing defences is required. There will also be a negative impact on sediment, geology, and geomorphology (coastal processes) as the presence of the seawall will prevent sediment recharge from cliff erosion. Beneficial effects have been identified on coastal material assets and physical mental wellbeing as the maintenance of the defences will continue to protect the town, reducing any stress and anxiety caused by fear of potential property loss. The maintenance of the defences will also strive to adapt to the changes in climate. Table A1 - 6.04 in Appendix 1.1 presents a full summary of these results.

##### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the seawall and groynes will continue to be maintained. No significant adverse or beneficial impacts have been identified during this timeframe.

The structural integrity of the pier will be threatened by sea level rise and the dropping of beach levels. Work would also be required to maintain the structural integrity of the sea wall. These will both have a negative impact on material assets and short term temporary adverse impacts

on noise and air quality where construction is required. There will be little or no beach, which could have a negative impact on tourism and recreation and the associated local economy. The loss of the beach will also have a negative impact on the natural landscape. This could also have an indirect effect on the built landscape through reduced visitor numbers which could result in the closure of tourist related facilities leading to sections of the town becoming empty or derelict. The seawall is a listed structure, therefore any work which is required to maintain its structural integrity could affect its listing, thus having a negative impact in the historic environment. The maintenance / improvement of the existing defences might not be sufficient in order to adapt to the rise in sea level and storm surges predicted from climate change which, as discussed, will threaten the integrity of the pier, commercial properties on the promenade and the sewage pumping station which is also located on the promenade. The loss of beach caused by the maintenance of the existing defences will also reduce the town's natural defence from increased wave intensity therefore a negative impact has also been identified on coastal flooding and sediment, geology, and geomorphology (coastal processes) through the prevention of natural coastal processes. Table A1 - 6.04 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

The defences will continue to be maintained in the long term. This will result in a loss of the beach along this policy unit therefore significant adverse impacts have been identified on both sediment, geology, and geomorphology (coastal processes) and natural landscape and seascape by this timeframe.

Other impacts will be the same as those that have been identified for the medium term, however negative impacts on coastal activities and landscape will be more pronounced due to the complete loss of the beach. A negative impact has also been identified on physical and mental wellbeing. If visitor numbers reduce it could cause increased stress and anxiety for those people that rely on the tourist trade for income and could potentially have knock on effects on the local economy. There may also be a native affect on the AONB during this timeframe as a small section of AONB is located in the far west of this policy unit and the loss of the beach will impact on the relationship between the land and sea. Table A1 - 6.04 in Appendix 1.1 presents a full summary of these results.

#### Impacts on policy unit 6.04 – Cromer if there were no active intervention

If there were no active intervention at Cromer there would be complete failure of the seawall by the medium term, resulting in the loss of a large number of residential and commercial properties as well as services, infrastructure and key facilities within the town. In the long term no defences would be present and there would be further loss. This would have significant adverse impacts on material assets, coastal activities and industries and physical and mental wellbeing as well as the built landscape. There would also be impacts on surrounding towns and villages as Cromer is a key service centre for the region. If no active intervention were to be applied to this policy unit the loss of the defences would allow for the reestablishment of natural coastal processes and a beach would be present through sediment input from cliff erosion.

### 8.1.5

#### 6.05 Cromer to Overstrand

##### Current situation

Along this section there is timber revetment which has failed and is considered redundant. A number of timber groynes remain in place, however these have a residual life of <5-10 years.

##### Continuation of present management

In the short term, the erosion of the cliffs would continue at a rate similar to present. In the medium term erosion of the cliffs would continue but may be accelerated due to a rise in sea level, the groynes would need to be rebuilt in a retreated position, however, would retain material from cliff erosion that is not lost offshore to maintain the beach in a similar state as it is in today. In the long term, the groynes would need to be rebuilt in a retreated position in line with shoreline movements. Movement of sediment into this policy unit may be restricted by the



development of promenades at the adjacent policy units which could result in a greater retention of material and the possibility of a larger beach developing.

#### Preferred policy

The cliffs along this frontage are a vital source of sediment for the SMP area therefore a key aim is to maintain this source of sediment.

The short, medium and long term policy options for this stretch of coastline are no active intervention.

**Table 8.5: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.05**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	✓	✓✓	✓
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓

#### Results of the assessment of the preferred policy option in the Short Term

In the short term the revetment and timber groynes would be allowed to fail. No significant adverse or beneficial impacts have been identified during this timeframe.

There will be a slight negative impact on coastal activities and industries as Paston coastal footpath will be lost which could have an impact on recreation and tourism, however there is the possibility of re-routing this footpath, reducing any negative effect. Overstrand Cliffs are designated as an unprotected SAC and SSSI therefore the continued erosion of these will support this designation resulting in a slight positive impact on protected sites and species as well as maintaining the natural landscape. A positive impact on the AONB has been identified during this timeframe as natural erosion of Overstrand Cliffs SAC/SSSI will be allowed to continue which maintaining this quality of the AONB. Table A1 - 6.05 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Medium Term

In the medium term no defences would be present. The timber groynes, which are currently present along this stretch, will have disappeared allowing sediment to be transported freely along this stretch of the coast, therefore having a beneficial impact on substrate. A further beneficial impact has been identified on protected sites and species as the loss of the defences will result in nothing prohibiting the erosion of Overstrand Cliffs SAC and SSSI further supporting their unprotected designation.

There will be slight negative impacts on coastal activities through further loss of the footpath and loss of part of the Royal Cromer Golf Course and possible access to the beach. The loss of part of the golf course will also result in a negative impact on physical and mental wellbeing as it could potentially cause stress and anxiety to the owners of the golf course through potential loss of earnings. A negative impact has also been identified on adapting to climate change as the climate will become more stormy and sea levels are predicted to rise, but there will be no defences to protect the coastal communities. However the lack of groynes or defences will mean that the beach along this stretch will remain providing a natural protection to the existing coastline against increased wave intensity and any related flooding, therefore a slight positive impact on coastal flooding has been identified. A slight positive impact has also been identified on landscape, as by allowing the groynes to deteriorate and be naturally removed. There will be mixed impacts on the AONB during this timeframe as on one hand the cliffs will continue to erode naturally having a positive impact. On the other hand loss of part of the golf course may change the land use if in this area impacting on the character of the AONB. Also the loss of defences will change the current relationship as it stands between the land the sea, though it should be considered the overall aim is to achieve a naturally functioning coastline. Table A1 - 6.05 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

No significant adverse or beneficial impacts have been identified during this timeframe. As the existing defences would be completely lost during the medium term the beneficial impacts on protected sites and species would be felt in the medium term the effect of this loss would be reduced in the long term.

Other impacts in the long term will be the same as those identified in the short and medium term, however the negative impact on coastal activities and industries may be more pronounced as there will be further loss to the Royal Cromer Golf Course, Paston footpath and access to the beach. This in turn will continue to have mixed impacts on the AONB as outlined above. Table A1 - 6.05 in Appendix 1.1 presents a full summary of these results.

## 8.1.6

### 6.06 – Overstrand

#### Current situation

At present there is a concrete seawall along the northern section and a timber revetment along the southern section and there are steel groynes along the entire frontage. The residual life of the seawall is approximately <5-10 years and the groynes <15 years.

#### Continuation of present management

If current management were to continue at Overstrand in the short term the cliffs to the north of Overstrand would be held in their present position by the presence of the seawall, whereas the cliffs to the south will continue to erode at a similar rate to present. There would be some sediment supply from the north to the south, however this would be limited by the defences. In the medium term the seawall will continue to hold the cliffs to the north of Overstrand in their current position and the area will become more prominent as there will be cutback at either end of the seawall. The defences would require large amounts of maintenance and little or no beach will be present. To the south of Overstrand the cliffs would continue to erode, however the revetment and groynes would need to be rebuilt in a retreated position. The beach is likely to become narrowed due to limited sediment supply from the north. In the long term the seawall will hold the cliffs, however, an increase in the wall structure would be required to maintain its effectiveness and prevent outflanking. There would be no beach present and sediment supply to the south would be cut off. To the south of Overstrand the revetment and groynes would need to be rebuilt in a retreated position and the cliffs would continue to erode. There would be little or no beach present due to a blockage of sediment supply from the north and rapid movement of sediment from this area to the south.

#### Preferred policy

This area is a vital source of sediment supply for the SMP area therefore the long term plan is to allow for continuation of the supply for transport along the frontage.

In the short term the policy for Overstrand is to hold the existing line and in the medium and long term the policy is for managed realignment but only when such adequate mitigating social measures are in place to limit the impact on the lives of individuals and the community, would the change to managed realignment policy be implemented.

**Table 8.6: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.06**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Water quality	x	xx	x
Historic environment and archaeology	=	xx	xx
Built landscape and townscape	x	xx	xx
Coastal material assets	x	xx	xx

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Coastal activities and industries	-	x	xx
Physical and mental wellbeing	x	xx	xx

#### Results of the assessment of the preferred policy option in the Short Term

In the short term the line will continue to be held therefore no significant adverse or beneficial impacts have been identified.

There will be a loss of some residential properties to the south of Overstrand which will have negative impacts on coastal material assets through the loss of property and on physical and mental wellbeing caused by stress and anxiety to the owners of the lost properties. The sewers will also be lost with the properties at the southern end of the village therefore if appropriate mitigation is not put in place there could potentially be a negative impact on water quality. There is the potential for temporary negative impacts on air quality and noise if any construction is required to maintain the defences during this timeframe. A negative impact has also been identified on the built landscape through the loss of property. Maintaining the defences during this timeframe could have a negative impact on parts of both Overstrand Cliffs SSSI and Sidestrand and Trimingham Cliffs SSSI as the defences will continue to prevent the natural erosion of the cliffs which are both designated for their exposure. Table A1 - 6.06 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Medium Term

In the medium term managed realignment will result in the loss of more seafront properties, part of the high street, a school, services and roads with the properties, beach access and the car park. This will have significant adverse impacts on physical and mental wellbeing through stress and anxiety to property and land owners and on coastal material assets through loss of property and coastline infrastructure. Significant adverse impacts have also been identified on the historic environment and archaeology through the loss of the 'Sea Marge' a grade II listed property and the built landscape and townscape through a significant loss of property and the built environment. There is also the potential for significant adverse impacts on water quality as there will be further loss of sewers associated with properties as well as a pumping station and a storage tank sewer. Therefore if appropriate mitigation is not implemented with the preferred policy there could be a significant adverse impact on water quality.

There will also be a negative impact on coastal activities and industries through impacts on the tourism industry due to loss of facilities and beach access. A negative impact on adapting to changes in the climate has also been identified as the managed realignment will not provide for defences against sea level rise and storm surges. Positive impacts have been identified on protected sites and species as increased erosion could improve the status of the County Wildlife Site. A positive impact has also been identified on sediment, geology, and geomorphology (coastal processes) as natural coastal processes will be allowed to take place once the sea defences have been lost. Table A1 - 6.06 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

During this timeframe there will be further loss of residential and commercial properties, community and tourist facilities. Therefore there will continue to be significant adverse impacts on physical and mental wellbeing and coastal material assets as well as the built environment and townscape both through the physical loss of infrastructure and any associated blight<sup>1</sup> in adjacent areas. There will also be significant impacts on coastal activities and industries caused by the loss of associated infrastructure and services. Significant impacts on the historic environment and archaeology will continue due to the loss of 'The Pleasance', another grade II listed building.

<sup>1</sup> Deterioration / dilapidation

A beneficial impact has been identified in during this timeframe on sediment, geology, and geomorphology (coastal processes) as reduction in defences along this section will allow for natural coastal processes to be reinstated allowing for the beach to be maintained.

Slight beneficial impacts have been identified on coastal flooding as the beach will be maintained therefore providing a natural defence against increased wave intensity and any potentially associated flooding. Slight beneficial impacts on protected sites and species has also been identified as the loss of any defences will allow the part of Overstrand Cliffs SAC and SSSI which falls within this policy unit and the part of Sidestrand and Trimmingham Cliffs SSSI which falls within this policy unit to erode naturally. Beneficial impacts have not been identified on protected sites and species during this timeframe as the policy is managed realignment therefore it is anticipated that some degree of defence or temporary defence will still be present during this timeframe. Table A1 - 6.06 in Appendix 1.1 presents a full summary of these results.

Impacts on policy unit 6.06 – Overstrand if there were no active intervention

If there were no active intervention at Overstrand the effects would be similar to those that have been identified, however they would occur at a shorter timeframe as the seawall, timber revetment and groynes will all fail in the short term. This would not allow sufficient time for the implementation of adequate mitigating social measures to be put in place to limit the impact on the lives of individuals and the community.

8.1.7

*6.07 – Overstrand to Mundesley*

Current situation

At present between Overstrand and Trimmingham there are no remaining built defences. At Trimmingham itself the timber revetment has largely failed and the groynes are in poor condition. South of Trimmingham there is a timber revetment and timber groynes which both have a residual life of <15 years.

Continuation of present management

If current management were continued, in the short term the beach between Overstrand and Trimmingham would be similar to how it is at present. South of Trimmingham the defences will restrict the cliff erosion, however the beach will be similar to how it is at present due to sediment supply from erosion of the cliffs to the north. In the medium term, cliff erosion to the north would continue at a similar rate to present supplying sediment to the south, and to the south of Trimmingham there will be limited cliff erosion due to the presence of the defences and a narrowing of the beach. The timber revetment and groynes will need to be rebuilt further back from their present position.

If defences were to be reconstructed along this frontage they would prevent cliff erosion which will result in a reduction in beach levels. In addition a decrease in sediment supply from this area will affect the SMP area as a whole as this section of coastline provides the largest source of sediment.

Preferred policy

This frontage provides the largest source of sediment for maintaining the beaches along the SMP area. If erosion is restricted here there is the potential that it could accelerate the erosion rate elsewhere. Therefore the long term plan for this policy unit is to promote a naturally functioning coast and to allow retreat.

The policy option for this stretch of coastline in the short, medium and long term is no active intervention. However a small section of the coast in front of the Trimmingham will be held in the short term until adequate mitigating social measures are put in place to limit the impact on the lives of individuals and the community.

**Table 8.7: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.07**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Built landscape and townscape	x	xx	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	x	xx	xx

#### Results of the assessment of the preferred policy option in the Short Term

In the short term the timber revetment and groynes to the north of Beach Vale Road will be allowed to fail and the timber revetment and groynes to the south will be maintained. No significant adverse or beneficial impacts have been identified during this timeframe.

There will be negative impacts on physical and mental wellbeing and coastal material assets as there will be loss to residential properties and farmland at Trimingham. There will also be negative impacts on coastal activities through the loss of farmland, the loss of local access roads and some loss of land at the caravan park. There will also be a negative impact on ecosystems and biological diversity as there could potentially be a loss of cliff top habitats. On the reverse the cliffs will be allowed to evolve naturally, maintaining the exposure of the SSSI designated cliffs; thus a positive effect on protected sites and species has been identified. There could be mixed impacts on the AONB along this stretch of the coastline, on one hand the no active intervention policy option will allow Sidestrand and Trimingham Cliffs SSSI to erode naturally having a positive impact on this quality of the AONB. On the other hand there will be loss of properties and farmland along this stretch of coast which will have a negative impact on the character of the AONB.. Table A1 - 6.07 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the timber revetment and groynes to the south will be allowed to fail resulting in significant impacts on coastal material assets, coastal activities and industries and physical and mental wellbeing as properties will be lost at Trimingham and some properties will be lost to the north of Sidestrand. The caravan park will also be totally lost, having significant impacts for the recreation and tourism sector. Part of the main coast road will be lost which links surrounding villages to Trimingham and other towns along the road thus having a significant effect on the access of the residents of these villages to services and facilities. Adverse effects have also been identified on the built landscape and townscape through the loss of property and blight in surrounding areas.

As the current defences will no longer be present within this timeframe natural coastal processes will be able to take place, having positive impacts on substrate. However as no defences will be in place this policy will have a negative impact on adapting to changes in climate in particular sea level rise. The change to a managed realignment policy during this timeframe will allow natural erosion of the SSSI cliffs therefore a positive impact has been identified on protected sites and species. There will continue to mixed impacts on the AONB however the ultimate aim of the policy along this stretch is to achieve a naturally functioning coastline. Table A1 - 6.07 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

In the long term there will be further loss of residential property resulting in continued significant effects on coastal material assets, coastal activities and industries, physical and mental wellbeing and the built landscape and townscape. There will be a beneficial impact on sediment, geology, and geomorphology (coastal processes) during this timeframe as the loss of the defences will allow natural coastal process to take place maintaining the beach and sediment supply.

Other impacts will be the same as those identified in the medium term. There will be a negative impact on the historic environment as Trimmingham Church will be lost during this timeframe. A negative impact has also been identified on ecosystems and biodiversity caused by the potential loss of cliff tops habitats caused by coastal squeeze. There will also be a slight beneficial impact on protected sites and species resulting from the loss of defences allowing erosion of Sidestrand and Trimmingham Cliffs SSSI. However this impact will be less pronounced than along other sections of cliffs as the current defences along this section are minimal allowing some erosion to take place therefore the implementation of the preferred policy will not cause a significant change from the baseline situation. There will continue to be mixed impacts on the AONB due to continued exposure of the SSSI coupled with further loss of properties and farmland impacting on the character. Table A1 - 6.07 in Appendix 1.1 presents a full summary of these results.

### 8.1.8

#### 6.08 Mundesley

##### Current situation

At present there is a timber revetment, with a row of steel piles retaining concrete cubes which protects the northern half of the frontage. A concrete wall and promenade front the southern section and the entire length is timber groyned.

##### Continuation of present management

If current management were continued, in the short term the cliffs would be held in their current position by the seawall and a narrow beach would be maintained by the groynes trapping sediment from the north as exposure of the frontage increases. In the medium term the cliffs will remain in their present position and this area will increase from a promontory due to cut back either side increasing the exposure to waves as little or no beach will be present. In the long term the cliffs will continue to be held but extension to the defences would be necessary to prevent outflanking. The defences would trap sediment from the north however they would prevent sediment supply to the south accelerating erosion there.

##### Preferred policy

Retaining defences in Mundesley could potentially block 70% of the sediment supply for the entire SMP area accelerating erosion elsewhere; therefore the long term plan is to allow retreat.

The policy at Mundesley is to hold the line in the short and medium term with managed realignment in the long term but only when such adequate mitigating social measures are in place to limit the impact on lives of individuals and the community, would the long term change to managed realignment be implemented.

**Table 8.8: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.08**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Built landscape and townscape	x	x	xx
Coastal material assets	x	x	xx
	✓	✓	
Coastal activities and industries	-	x	xx
Physical and mental wellbeing	x	x	xx

##### Results of the assessment of the preferred policy option in the Short Term

In the short term the existing defences will be maintained and no significant adverse or beneficial impacts have been identified.

There will be negative impacts on coastal material assets and associated physical and mental wellbeing caused by increased stress and anxiety caused by the loss of some property at

Cliftonville. There is the potential for temporary negative effects on air quality and noise if any construction is necessary in order to maintain the defences. A negative impact has also been identified on sediment, geology, and geomorphology (coastal processes) as the presence of the defences will prevent natural coastal processes from taking place. However the maintenance of the defences will have a positive impact on adapting to changes in climate as they will provide a level of protection against sea level rise and potential storm surges. The maintenance of the defences during this timeframe could also have a negative impact on protected sites and species as they will prevent erosion to a small section of the Sidestrand and Trimming Cliffs SSSI which are designated for their exposure. Table A1 - 6.08 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Medium Term

As in the short term, during this time frame the existing defences will be maintained and no significant adverse or beneficial impacts have been identified.

There will be no further loss of property so negative impacts on stress and anxiety and material assets will potentially be reduced. The negative effect on coastal activities however will still remain, as by this timeframe the maintenance of the defences will mean that there will be little or no beach which could potentially result in a reduction in the number of tourists thus impacting on tourism and recreation and the associated economy. There could also potentially be slight negative impacts of dust and noise associated with any construction works needed to maintain the defences. There will be a continued negative impact on sediment, geology, and geomorphology (coastal processes) through the prevention of natural coastal processes. Table A1 - 6.08 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

In the long term the policy is for managed realignment by allowing the existing defences to fail. This will result in the loss of a large number of residential property and commercial property thus having significant adverse impacts on coastal material assets and physical and mental wellbeing. There will also be loss to link roads and a section on the B1159 further impacting on surrounding communities who rely of these transport links for employment and use of facilities. The loss of property and infrastructure will also further impact on the coastal activities including tourism and recreation. The large loss of property could potentially result in other properties in the area to becoming vacant / derelict in the surrounding area which will also have a significant adverse impact on the built landscape.

There will be some loss to heritage sites having a negative effect on the historic environment and archaeology. The removal of the defences however, will allow for natural coastal processes to take place thus having a positive effect on sediment, geology, and geomorphology (coastal processes) as well as improving the exposure of the cliffs and the natural landscape. However, cliff top grassland, which is part of the CWS, will be lost having negative effects on protected sites and ecosystems. Table A1 - 6.08 in Appendix 1.1 presents a full summary of these results.

#### Impacts on policy unit 6.08 – Mundesley if there were no active intervention

If policies were not implemented the existing defences would largely remain in place until the end of the short term, the seawall would fail at the beginning of the medium term and there will be no defences present in the long term. The effect of this would largely be the same as that which has been identified for the policies however property loss would occur at a much earlier timeframe. This would not allow sufficient time for the implementation of adequate mitigating social measures to be put in place which would limit the impact on the lives of individuals and the community.

### 8.1.9

#### 6.09 Mundesley to Bacton Gas Terminal

##### Current situation

At present the entire length is fronted by a timber revetment and timber groynes along the frontage.



### Continuation of present management

If the present management is continued, in the short term the rate of erosion of the cliffs will be similar to that at present. Groynes will trap some material from the north which would maintain the beach in its present condition. In the medium term the revetment and groynes would need to be rebuilt in a retreated position and the erosion rate may increase due to sea level rise. The beach would be similar to present due to a supply of sediment from the north, though this may be reduced due to defences at Mundesley. In the long term the revetment and groynes would require frequent rebuilding and there would be drop in beach volume due to limited sediment supply from the north.

### Preferred policy

The long term plan for this policy unit is retreat to allow for a naturally functioning coastline.

The short, medium and long term policies for this area are for no active intervention.

**Table 8.9: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.09**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Historic environment and archaeology	x	xx	xx
Built landscape and townscape	x	x	xx
Coastal material assets	x	x	xx
Coastal activities and industries	x	x	xx
Physical and mental wellbeing	x	xx	xx

### Results of the assessment of the preferred policy option in the Short Term

In the short term the timber revetment and groynes would be allowed to fail, however no significant adverse or beneficial impacts have been identified during this timeframe.

There will be negative effects on material assets and physical and mental wellbeing as there will be loss of some seafront properties at the southern end of Mundesley. There will be a negative effect on coastal activities due to a loss of farmland in the area. However, by allowing the timber revetment and groynes to fail there will be beneficial effects on the natural landscape and protected sites by maintaining the exposure of the SSSI designated cliffs. There will be mixed impacts on the AONB, on one hand the no active intervention policy will allow the designated cliffs to erode naturally which is a quality of this AONB. On the other hand the loss of properties may have a negative impact by affecting the character of the AONB. Table A1 - 6.09 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

In the medium term no defences would be present and further property and farmland will be lost as well as the partial loss of Mundesley Holiday Camp which was the first purpose built holiday camp in the UK. A Saxon Cemetery, which has a high heritage value, will be lost at this timeframe having significant adverse impacts on the historic environment and archaeology. Impacts on mental and physical wellbeing due to stress and anxiety will also increase associated with the loss of property and land and the financial implications. Beneficial impacts have been identified on sediment, geology, and geomorphology (coastal processes) as this policy will allow for naturally functioning coastal processes to take place and the maintenance of a beach, which in itself will act as a natural sea defence allowing for greater dispersion during storms and erosion of the cliffs at a sustainable rate.

The lack of defences will not protect this section of the coastline against sea level rise and the potential for storm surges so a negative impact on adapting to changes in climate has also been identified. The loss of property will have negative effects on the built landscape and townscape, however the loss of the defences will have beneficial effects on the natural



landscape as well as protected sites through the continual exposure of the SSSI designated cliffs. The mixed impacts on the AONB will continue into this timeframe and further affected by the loss of further property and heritage sites both of which contribute to the character of the AONB. There may also be impacts on the relationship between the land and the sea through the loss of the defences that are currently in place. Table A1 - 6.09 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

In the long term there will continue to be adverse impacts on the historic environment and archaeology as well as physical and mental wellbeing. During this timeframe further adverse impacts have been identified on the built environment, material assets and activities and industries due to further loss of property and land. The mixed impacts on the AONB will continue into this timeframe though it should be considered that the overall aim of this policy unit is to allow a naturally functioning coastline to develop. Table A1 - 6.09 in Appendix 1.1 presents a full summary of these results.

### 8.1.10

#### 6.10 – Bacton Gas Terminal

##### Current situation

Currently the northern section of this policy unit is fronted by a timber revetment which is semi buried and timber groynes are present throughout this length.

##### Continuation of present management

If current management were to be maintained this section of the coastline would increasingly form a promontory resulting in material being lost to sea rather than transported along the shoreline. The groynes and revetment would need frequent replacing in the long term.

##### Preferred policy

If defences are maintained in this location they could potentially block up to 70% of the sediment supply for the entire SMP. This would result in this area forming a promontory and could result in accelerated erosion elsewhere along the coast. Therefore the long term plan in this area is to allow retreat and a natural shoreline to develop.

The policy for the short and medium term is to hold the existing line; the policy in the long term is for managed realignment.

#### Results of the assessment of the preferred policy option in the Short Term

In the short term the timber revetment would be replaced by a seawall and the groynes would be maintained. No significant adverse or beneficial impacts have been identified on this policy unit at this timeframe.

The maintenance of the defences will hold the cliffs in the present position, resulting in poor exposure of the cliffs therefore having a negative effect on protected sites. There will also be negative effects on sediment, geology, and geomorphology (coastal processes) through the prevention of natural coastal processes and negativity impacting on the natural landscape. The maintenance of the defences could also potentially have temporary negative impacts on noise and air quality where construction is required; however these impacts are not likely to be significant as there are no residential properties along this section of the coastline. The presence of the defences may also be detrimental to habitats therefore a negative effect on ecosystems and biological diversity has also been identified. Positive impacts have been identified on coastal material assets through the protection of the gas terminal and the maintenance of the defences themselves. The hold the line policy will have a negative impact on the AONB part of which falls within this policy unit as maintaining the defences will reduce the exposure of Mundesley Cliffs SSSI which is a quality of this AONB. Table A1 - 6.10 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the seawall and groynes will be maintained as in the short term no significant adverse or beneficial impacts have been identified on this policy unit at this timeframe.

The impacts in the medium term will largely be the same as those identified in the short term, however, a further negative impact has been identified on coastal flooding as the maintenance of the defences will reduce the beach volume therefore reducing the ability of this foreshore to disperse the energy of waves particularly during storm events. Continuing to hold the line will continue to have a negative impact on the ANOB associated with the impact on the designated cliffs. Table A1 - 6.10 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

In the long term the managed realignment policy will be implemented which will result in the loss of the seaward edge of the terminal site. This will have negative effects on material assets, industries and physical and mental wellbeing which could be associated with the potential for reduced employment at the gas terminal. Impacts on the natural landscape and protected sites will become beneficial as cliff erosion will be enhanced, exposing the SSSI and allowing for natural coastal processes to take place. This will have positive effects on sediment, geology, and geomorphology (coastal processes) and hydrology. Reverting to the managed realignment policy option will have mixed impacts on the AONB; on one hand it will increase the exposure of the designated cliffs having a positive impact on the other the loss of some of the gas terminal site which falls within the remit of the AONB may have negative impacts on the quality of its character. Table A1 - 6.10 in Appendix 1.1 presents a full summary of these results.

### Impacts on policy unit 6.10 – Bacton Gas Terminal if there were no active intervention

If there were no active intervention along this section of the coastline the timber revetment and groynes would fail during the short term resulting in the loss of the terminal site at a shorter timeframe.

## 8.1.11

### 6.11 – Bacton, Walcott and Ostend

#### Current situation

At present there is a sloping concrete sea and wave wall which has a residual life of <15 years and timber groynes which have residual life of <5-10 years.

#### Continuation of present management

If present management were continued along this frontage, in the short term sediment would continue to be supplied from beaches to the north, however this would be reduced from the current supply. In the medium term the cliffs will continue to be held in their present position by the seawall and the beach is likely to be much narrower than at present due to the reduction in sediment supply. In the long term the sea wall will be increasingly exposed due to the lack of beach an increased sea level, therefore will require frequent maintenance to maintain its integrity.

#### Preferred policy

The long term plan for this area is to allow retreat once the existing defences have reached the end of their residual life, in order to prevent accelerated erosion elsewhere.

The short term policy is to hold the existing line, and the medium and long term preferred policies are for managed realignment. This policy would only be adopted when adequate mitigating social measures are in place, which minimise the impacts on the lives of individuals and communities would.

**Table 8.11: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.11**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected Sites and Species	-	-	xx
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Historic environment and archaeology	xx	=	-
Built landscape and townscape	xx	xx	xx
Coastal material assets	xx	xx	xx
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	xx	xx	xx

#### Results of the assessment of the preferred policy option in the Short Term

In the short term the seawall and timber groynes will be maintained. This stretch of coastline will still be at high risk of erosion despite the presence of defences, therefore there could still be loss of residential properties at Ostend. This in turn will have adverse impacts on coastal material assets, physical and mental wellbeing and the built landscape and townscape. Ostend House, which is listed on the SMR register, will also be lost having adverse impacts on the historic environment and archaeology.

There is the potential for the loss of some holiday accommodation which will have a negative effect on coastal activities and industries due to the impact on tourism and recreation in the area. If the defences were to fail during this timeframe temporary structures will be put in place in order to reduce the rate of erosion. This could result in temporary short term impacts on noise and vibration during construction. Table A1 - 6.11 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the seawall and groynes would be allowed to deteriorate and fail and the policy will result in the loss of a large number of residential and commercial properties having more pronounced adverse effects on coastal material assets, physical and mental wellbeing and the built landscape. There will be losses to caravan parks and holiday homes resulting in adverse impacts in the tourism and recreation industry. There will be loss to the B1159 access road which in turn could have an impact on surrounding villages and communities.

There is also the potential for a negative effect on water quality caused by the loss of services and sewers with properties. However the loss of the defences will have positive impacts on sediment, geology, and geomorphology (coastal processes) as it will allow the natural movement of sediment along this stretch of coastline. This will also allow for the maintenance of the beach which will provide a degree of natural protection during storm events and have a positive impact in the natural landscape. Table A1 - 6.11 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

In the long term no defences would be present and the impacts will be similar to those identified in the medium term; however they could be more pronounced through further loss of residential and commercial properties, which could also indirectly impact further on surrounding communities and villages due to adverse impacts on the local economy. In the long term there is also the potential for an adverse impact on protected sites and species as if the cliffs erode back to the flood plain there could be saline intrusion into the Ant which in turn could affect the Broads SAC/ SPA and the Broadland Ramsar that are located downstream. Table A1 - 6.11 in Appendix 1.1 presents a full summary of these results.

Impacts on policy unit 6.11 Bacton, Walcott and Ostend if there were no active intervention

If the policies were not implemented along this stretch of the coastline the groynes would fail towards the start of the short term and the seawall towards the end of the short term timeframe. The impacts of this would be the same as those that have been identified however they would occur much sooner and uncontrolled than if the policies were to be implemented. This would not allow for sufficient time for the implementation of adequate mitigating social measures to be put in place which would limit the impact on the lives of individuals and the community.

8.1.12

6.12 – Ostend to Eccles

Current situation

At present the whole length of the shoreline is protected by a timber revetment and timber groynes. Some sections of the revetment are failing and some of the groynes are now redundant. Both have a residual life of <5-10 years. There are no defences to the south of the villages.

Continuation of the present management

If current management were to continue, in the short term erosion would continue at a similar rate as at present, however the timber revetment and groynes would need to be rebuilt in a retreated position. To the south of the villages where there are no defences the cliffs will continue to erode maintaining the beach. In the medium term the rate of retreat is likely to increase due to sea level rise and the revetment and groynes would need to be rebuilt in a retreated position. To the south the beach would be maintained and the will be continued southward transport of sand. In the long term frequent rebuilding of the revetment and groynes would be required. To the south of the villages the seawall at Eccles will maintain a wider beach at the southern end which will possibly enable some dune development.

Preferred policy

The long term plan for this area of the shoreline is to allow retreat as defending this section of the shoreline will adversely impact on the SMP area as a whole by restricting the movement of sediment.

The short, medium and long term policy for this policy unit is for no active intervention. However, in the short term every effort will be made to minimise the erosion rate using temporary measures in order to allow people to adapt to the changes in medium and long term.

**Table 8.12: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.12**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Historic environment and archaeology	=	x	xx
Built landscape and townscape	x	x	xx
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	xx	xx	xx

Results of the assessment of the preferred policy option in the Short Term

In the short term the timber revetment and groynes would be allowed to fail and there will be loss to some seafront houses, caravan park and farmland which will have adverse effects on physical and mental wellbeing due to the stress and anxiety caused by the loss of property.

There will also be negative effects on material assets through the direct loss of property and land and coastal activities and industries due to the loss of farmland and the impact on tourism and recreation due to the loss of the caravan site. A positive impact has been identified in

protected sites as the continued erosion will maintain the exposure of the SSSI designated cliffs. Table A1 - 6.12 in Appendix 1.1 presents a full summary of these results.

*Results of the assessment of the preferred policy option in the Medium Term*

In the medium term no defences would be present and there will be further loss of property and land, resulting in adverse impacts on physical and mental wellbeing and coastal activities and industries. A beneficial impact has been identified on sediment, geology, and geomorphology (coastal processes) as the loss of the defences will allow natural coastal processes to take place.

A Grade I listed building (St Mary's Church) and a grade II listed (Manor House and Hill House Hotel) will be at risk of erosion having a negative impact on the historic environment and archaeology. The loss of property will adversely affect the built landscape, however by allowing natural coastal processes to take place will have beneficial impacts the natural. Table A1 - 6.12 in Appendix 1.1 presents a full summary of these results..

*Results of the assessment of the preferred policy option in the Long Term*

In the long term the impacts will largely be the same as those identified in the medium term. However there will be further adverse impacts on the historic environmental and archaeology due to the loss of the Grade I and II listed buildings. There will also be an adverse effect on the built landscape and townscape due to the cumulative loss of property over the three time periods. Table A1 - 6.12 in Appendix 1.1 presents a full summary of these results.

8.1.13

6.13 – Eccles to Winterton Beach Road

*Current situation*

At present there is a concrete seawall to the north of Sea Palling which is fronted by steel groynes both have a residual life of around 20 years. From Sea Palling to Waxham there are nine offshore rock reefs and a concrete seawall, the reefs have a residual life of around 50 years and the seawall <35-40 years. Between Waxham and Bramble Hill there is a concrete seawall which is fronted by both new and old groynes, the seawall has a residual life of <5-10 years as this is dependent on the condition of the beach, the old groynes have a residual life of <5-10 years and the new groynes around 20years. The seawall continues at Bramble Hill to Winterton Ness however there are only old groynes present along this stretch at present. Both the seawall and groynes have a residual life of <5-10 years.

*Continuation of present management*

In the short term at Eccles the dunes would be held in their current position by the seawall and the groynes would trap sediment transported from the north. Between Sea Palling and Waxham the presence of the reefs would result in little change to this section of the coastline and the beach between Waxham and Winterton Ness would also be similar to present. In the medium term at Eccles the seawall will continue to hold the shoreline in its current position however there will be some outflanking and reduction in beach at the northern end of the seawall. Between Sea Palling and Waxham the beach is likely to reduce in volume as a result of sea level rise, however it will still remain in reasonable condition due to the presence of the offshore reefs. Between Waxham and Winterton Ness the beach will become narrower as the sea level rises and the prevention of landward movement by the seawall and groynes. There is the potential for some cutback at the southern end of the seawall and the wall itself will require maintenance to protect against flooding. In the long term at Eccles the seawall is likely to require significant work and the beach will have almost disappeared. Between Sea Palling and Waxham the dunes would be held in their current position by the seawall, however the beach would have diminished due to insufficient sediment supply compared with the expected sea level rise and increased wave exposure. Between Waxham and Winterton Ness the beach is likely to disappear and the area will increasingly form a promontory as landward movement would be prevented by the defences.

### Preferred policy

This unit is at risk of coastal flooding as well as erosion due to the low lying land behind the defences. Therefore the policy for this unit is to maintain the existing line in the short, medium and long term. However the hold the line policy option in the long term is conditional on the policy remaining technically, economically and environmentally sustainable. If this is not the case then managed realignment will be taken forwards as the policy option providing all the required details studies, strategies and monitoring have been undertaken to justify this change in aim.

The short, medium and long term policy for this stretch of coastline is to hold the existing line.

**Table 8.13: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.13**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	-	*	xx

### Results of the assessment of the preferred policy in the Short Term

No significant adverse or beneficial impacts have been identified in the short term. The current defences will continue to be maintained and there could be temporary negative impacts on noise and air quality due to the maintenance and replacement of the existing defences. There will also be a negative impact on sediment, geology, and geomorphology (coastal processes) and the maintenance of the defences (sea wall) will prevent natural coastal processes and landward movement therefore restricting the amount and the movement of substrate. This in turn interferes with the natural movement of sand between the beach and the upper shore which is necessary for the maintenance of Winterton – Horsey Dunes SAC / SSSI. This also impacts on the water quality in the dune slacks adversely affecting the Natterjack toad. During the short term it is likely that the wall will remain buried by sand this is thought to mitigate any negative impact on the protected sites and species, therefore at this timeframe no impact has been identified on predicted sites and species. Positive impacts have been identified on adapting to changes in climate as the defences will protect the low lying land from increased risk of flooding due to sea level rise, which in turn will also have a positive effect on physical and mental wellbeing as the presence of the defences will reduce the fear of property loss. Table A1 - 6.13 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the defences will continue to be maintained and the impacts of the preferred plan will be the same as those that have been identified in the short term as the defences will be maintained. Impacts on sediment, geology, and geomorphology (coastal processes) may become more pronounced as this area increasing forms and promontory and landward movement is prohibited. If there is no sediment supply via artificial recharge this may also result in negative impacts on predicted sites and species due to reduced movement of sand between the beach and the upper shore impacting on the SAC/SSSI. This will also have a negative impact on the AONB as these protected sites form part of the quality of the AONB. However on the other hand if the defences are maintained this will prevent the loss of property which is also part of the quality of this area therefore positive impacts have also been identified. Table A1 - 6.13 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

In the long term the defences will continue to be maintained this could result in an adverse effects on protected sites and species due to further restriction of the movement of sand between the beach and the upper shore if there is no artificial recharge.

Other impacts of the preferred policy on this unit will be the same as those identified in the medium and short term. There could also be a native impact on the natural landscape and seascape by this timeframe associated with loss of the dune area; this may also have slight native impacts on any recreation in the area which is associated with the dunes. Negative and positive impacts on the AONB will continue in this timeframe associated with the impacts on the

SAC/SSSI and no loss of properties. Table A1 - 6.13 in Appendix 1.1 presents a full summary of these results.

The policy option in the long term for this policy unit is to hold the line. However, this is conditional on the policy remaining technically and economically sustainable. If this is not the case then managed realignment would be taken forward as the policy option. Table 8.13b below presents the significant impacts in the long term if managed realignment was to be taken forward as the policy option.

**Table 8.13b: Summary of significant adverse and beneficial impacts if the managed realignment policy is taken forward as the policy aim in the long term**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	Please refer to the hold the line policy options in the short and medium terms		**
Ecosystems and biological diversity			**
Coastal flooding			**
Adapting to changes in climate			**
Historic environment and archaeology			**
Built landscape and townscape			**
Coastal material assets			**
Coastal activities and industries			**
Physical and mental wellbeing			**

If managed realignment is applied to this policy unit in the long term there would be a substantial loss of property and infrastructure resulting in adverse impacts on coastal material assets, the built landscape and townscape, activities and industries and physical and mental wellbeing. There would also be loss of a number of grade I listed buildings including a number of windmills. There would be adverse effects on coastal flooding and adapting to changes in climate as this area would become susceptible to extensive coastal flooding. Adverse impacts have also been identified on protected sites and species due to saline intrusion in the Broads SAC, SPA and Broadland Ramsar.

Impacts on policy unit 6.13 – Eccles to Winterton Beach Road if there were no active intervention

If the preferred policies were not implemented for this policy unit the seawall and reefs at Sea Palling will remain in the short term, however the seawall to the south may fail together with the old groynes. This would result in the a potential reduction in the Winterton Dune area due to natural fluctuations and reduced sediment feed. In the medium term the reefs and seawall will remain along Sea Palling, however the groynes to the south will fail during the beginning of this period. This would result in the high risk of damage to residential properties and community facilities. In the long term there will be no defences to the south but the reefs will probably remain in place this would result in the loss of further residential and commercial properties. If this area were allowed to flood the Broads which are designation as internationally important for their habitats and species and are also important for both national and international tourism as which supports the local economy.

#### 8.1.14

#### 6.14 – Winterton (South of Beach Road) to Scratby

##### Current situation

At present there are no man made defences along this stretch of the coastline. The natural dune system provides a natural defence, however these narrow towards the south.

### Continuation of present management

In the short term and medium terms there will be little change to the dune system or beach at Winterton. In the long term the system will also be similar, however the sediment supply from the north will be significantly reduced due to the area to the north forming a well defined promontory. Between Newport and Scratby there are also no defences, however despite the continual supply of sediment there will be deterioration of the dune ridge in the short term and sand would be transported through this frontage to beaches further south. In the medium term a reduction in sediment supply and sea level rise could result in the loss of the dunes as a natural defence by the end of this period and the beach will start to narrow. In the Long term the dunes would be lost and the beach would be narrower. However in the long term after 100 years it is expected that the erosion rate at this location would slow and begin to stabilise due to the areas to the south forming a promontory.

### Preferred policy

The long term plan for this section of the coastline is for a naturally functioning coast to develop through allowing the beach and backshore to evolve with minimal intervention.

The short, medium and long term policy option for this area is for no active intervention.

**Table 8.14: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.14**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	xx
Ecosystems and biological diversity	x	x	xx
Built landscape and townscape	x	x	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	-	x	xx
Physical and mental wellbeing	x	xx	xx

### Results of the assessment of the preferred policy option in the Short Term

In the short term no significant adverse or beneficial impacts have been identified.

There will some loss of property and infrastructure at Hemsby and Scratby as well as some of access roads. This will have a negative impact on coastal material assets and physical and mental wellbeing. The loss of property could also potentially impact upon the built landscape. Erosion of Hemsby Marrams dunes, which is an area of international significance, will continue therefore a negative impact on protected sites and species has also been identified. Table A1 - 6.14 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

In the medium term further properties and infrastructure will be lost at Hemsby and Scratby. There will also be some loss of a holiday development, tourist facilities and community facilities at these locations. This will have adverse impacts on material assets and physical and mental wellbeing as well as the built landscape and townscape.

The loss of tourist accommodation and facilities will have negative effects on coastal activities and industries through the impact on the tourism and recreation industry in the local area. Table A1 - 6.14 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

In the long term the negative effects would be even more pronounced due to the further property, infrastructure and facilities that will be lost. There will be further erosion to the dune system, and the CWS will be lost both resulting in adverse effects on protected sites and species and ecosystems and biological diversity in the area.



The lack of defences in the area will allow for a naturally functioning coastline and the beach to be maintained, which will provide a natural defence during stormy periods. Table A1 - 6.14 in Appendix 1.1 presents a full summary of these results.

#### 8.1.15

#### 6.15 – California to Caister-on-Sea

##### Current situation

At present there is a rock berm in front of the cliffs at California. At the southern end of the berm the cliff/dune face is covered by a concrete and asphalt seawall, both the seawall and the rock berm have a residual life of <35-40 years.

##### Continuation of present management

At California the cliffs will continue to erode at a similar rate to at present and the beach will be maintained in the short term. In the medium term erosion of the cliffs will increase due to rising sea level and the beach is likely to disappear at California, further south there will be some beach narrowing but the beach is likely to remain wide and provide protection to the seawall. In the long term there will beach in front of the rock berm at California, however, sand that has eroded from the cliffs will be retained behind the structure. To the south the area would increasingly form a promontory which could be detrimental to sediment movements to beaches further south.

##### Preferred policy

The long term plan for this stretch is to allow retreat, as the area will increasingly form a promontory which could be detrimental to downdrift areas.

In the short term the policy is to hold the line and only when adequate mitigating social measures are in place to limit the impact on the lives of the individuals and the community would the change to the managed realignment policy in the medium and long term be implemented.

**Table 8.15: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.15**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	xx
Ecosystems and biological diversity	x	x	xx
Built landscape and townscape	x	xx	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	-	x	xx
Physical and mental wellbeing	x	xx	xx

##### Results of the assessment of the preferred policy option in the Short Term

In the short term the rock berm would be maintained and there will be loss of some residential properties, holiday development land and potentially some loss to the road between Scratby and California. No significant adverse or beneficial impacts have been identified during this time period.

This will have negative impacts on material assets and physical and mental wellbeing as well as some impact on the built landscape due to the loss of property. There will also be a small loss to the CWS having a slight adverse impact on protected sites and species. In the short term the policy is to hold the line, which will require routine and reactive maintenance of the existing defences. This maintenance could potentially have slight temporary adverse impacts on noise and air quality where construction is required. Table A1 - 6.15 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the rock berm would be allowed to deteriorate and further property would be lost having an adverse impact on physical and mental wellbeing through the stress and anxiety caused by the loss of property. There would also be loss to some of the holiday development sites as well as some tourist and recreation facilities in the area. This will have an adverse impact on material assets through the direct loss of property and land. An adverse effect on the built landscape and townscape has also been identified due to the loss of property and any associated blight in adjacent areas.

There will be negative effects on activities and industries in the area as it could potentially reduce visitor numbers to the area impacting on the local economy. There would be further loss to the road which will affect the access between communities and loss of services with properties. The loss of services if not property controlled could potentially temporarily affect coastal water quality. The lack of defences however will have a positive impact on sediment, geology, and geomorphology (coastal processes) as it will allow for natural coastal processes to take place and the transport of sediment along the shoreline. Table A1 - 6.15 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

In the long term the affects would largely be the same as those that have been identified in the medium term, however they are likely to be more pronounced due to further loss of property, holiday sites, recreation and tourist facilities as well as further loss to the CWS.

There would be continued positive impacts on sediment, geology, and geomorphology (coastal processes) and a positive impact have also been identified on the natural landscape due to the lack of the defences. Table A1 - 6.15 in Appendix 1.1 presents a full summary of these results.

### Impacts on policy unit 6.15 California to Caister-on-Sea if there were no active intervention

If the policies were not implemented the rock berm would remain in the short and medium term, however this would fail and there would be no defences present by the long term. Implemented the hold the line policy in the short term and managed realignment in the medium and long term will not alter the impact on the shoreline, however the impacts would be delayed to enable measures to be put in place to appropriately manage the realignment.

## 8.1.16

### 6.16 – Caister-on-Sea

#### Current situation

Currently there is a seawall along this stretch and Y shaped groynes retain beach sand in front to protect the wall. To the south there are four rock reefs which are in front of the holiday village. The seawall has a residual life of <35-40 years and the rock groynes and the reefs around 50 years. To the south of the reefs the rock wall continues but the beach becomes narrower at this point. The stability of the wall is dependent on the health of the beach and has a residual life of around 20 years.

#### Continuation of present management

If present management were to continue in the short term the reefs and the groynes would continue to trap sediment from the north maintaining the beach. To the south of the reefs the wall will prevent retreat of the backshore and the beach will be maintained, however it will be narrower than that to the north. In the medium term there would be some beach narrowing to the north due to sea level rise however the beach would remain healthy due to the presence of the reefs. To the south beach narrowing and steepening will occur due to sea level rise and a reduction in sediment supply from the north. In the long term the area protected by the reefs could form a promontory reducing sediment bypass to the area to the south resulting little or no beach in front of the seawall to the south. Therefore the seawall here may require substantial maintenance to maintain its integrity.

### Preferred policy

In the long term the plan for this section of the shoreline is for a more natural retreated shoreline to develop in order to allow sediment transport and bypass along this section of the coast once measures are developed and put in place to manage any risk and mitigate the displacement of people and the loss of property and assets.

The short and medium term policy for this unit is to hold the existing line with the long term policy being managed realignment.

**Table 8.16: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.16**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	xx
Ecosystems and biological diversity	x	x	xx
Built landscape and townscape	-	-	xx
Coastal material assets	-	-	xx
Coastal activities and industries	-	-	xx
Physical and mental wellbeing	✓	✓	xx

### Results of the assessment of the preferred policy option in the Short Term

In the short term the maintenance of the defences will prevent the loss of property, land and facilities. No significant adverse or beneficial impacts have been identified during this timeframe.

The maintenance of the defences will have beneficial impacts on physical and mental wellbeing as stress and anxiety in relation to loss of property or land would be reduced. There could potentially be some deterioration of dunes and beach loss at the southern end having a negative effect on ecosystems and biological diversity. The maintenance of the defences could also potentially have temporary adverse impacts on noise and vibration if any construction is required. Table A1 - 6.16 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

No significant adverse or beneficial impacts have been identified on this policy unit at this timeframe.

The defences will continue to be maintained continuing to benefit physical and mental wellbeing. However the beach may become steeper and narrower which could result in a loss of area for tern nesting potentially impacting the SPA designation therefore having an adverse impact on protected sites and species. There could be continuing deterioration of the dunes at the southern end and some loss of the northern end of Caister Point CWS affecting ecosystems and biological diversity and protected sites and species. The narrowing of the beach and the deterioration of the dunes will also have a negative impact in the natural landscape. Table A1 - 6.16 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

In the long term the policy is for managed realignment. This will result in the loss of property, community and recreation and tourist facilities and services and infrastructure with the properties. This would have adverse impacts on material assets, physical and mental wellbeing, activities and industries and the built landscape both directly through direct loss of property and indirectly due to potential impacts on the local community and economy as a whole. There would be further loss to the CWS and dunes, impacting on protected sites and species and ecosystems and diversity, as steepening and narrowing of the beach would continue until the coastline stabilises potentially further impacting on the integrity of the SPA in policy unit 6.17.

The sewage infrastructure would be one of the first losses of the erosion along this section of the coastline and if not adequately controlled and remediated this could have negative impacts on coastal water quality.

However as the coastline evolves in a more natural way this impact is likely to reduce. The lack of defences and the re establishment of a natural coastline will have positive impacts on sediment, geology, and geomorphology (coastal processes) as well as the natural landscape. Table A1 - 6.16 in Appendix 1.1 presents a full summary of these results.

Impacts on policy unit 6.16 – Caister-on-Sea of there were no active intervention

If the policies were not implemented the seawall, rock reefs and groynes will remain in place during the short term which would result in the deterioration of the dunes and beach loss at the southern end. In seawall would fail by the end of the medium term which would result in the loss of some residential and commercial properties, CWS and some heritage properties during this timeframe. In the long term the rock reefs and groynes will deteriorate with the loss of a large number of residential and commercial properties and community and tourism facilities with increased risk of flooding to further properties. This would not allow for sufficient time to develop measures and put them in place to manage any risk and mitigate the displacement of people and the loss of property and assets.

8.1.17

6.17 – Great Yarmouth

Current situation

At present to the north of this policy unit there is a small cut off seawall behind the dunes. The dunes themselves provide some natural protection. The residual life of the seawall is around 50 years, however this is dependent on the health of the dune system. Further south the wall becomes re-exposed and a low concrete seawall and promenade front the Great Yarmouth seafront, however at present there is a wide beach in front of the wall providing defence. This wall has a residual life of around 50 years. To the south of the town the wall continues, however the beach narrows. The North Pier forms a groyne in itself and is part of the entrance to the port. This section has also got timber groynes. The seawall has a residual life of around 20 years, the groynes <15 years and the harbour arm around 20 years.

Continuation of present management

If present management were to continue, in the short term there would be little change to the beach at the northern end, however to the south the beach to the south will remain narrow. In the medium term the northern section will remain relatively unchanged, however to the south the beach will narrow and steepen and the wall would require maintenance to maintain its integrity as a defence. In the long term there will be some foreshore narrowing to the north as sea levels rise and there is a reduction in the sediment supply from the units to the north, however the beach will remain relatively wide. To the south the beach will disappear and substantial works would be required to maintain the seawall.

Preferred policy

The long term plan for this policy unit is to protect the assets from erosion and flooding as it is a major area of industry and commerce.

The short, medium and long term policy for this stretch is to hold the existing line.

**Table 8.17: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.17**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	-	x	xx
		✓	✓✓

#### Results of the assessment of the preferred policy option in the Short Term

In the short term the seawall, harbour arm and groynes will be maintained and there will be no loss to property or facilities within this policy unit. No significant adverse or beneficial impacts have been identified during this timeframe.

Positive impacts have been identified on material assets and physical and mental wellbeing due to reduced stress and anxiety associated with the fear of property loss. A positive impact has also been identified on adapting to changes in climate as the maintenance of the defences will protect the town from sea level rise and flooding. Temporary negative impacts have been identified on noise and air quality associated with construction necessary to maintain the integrity of the defences. At present it is thought that the North Denes SPA is accreting therefore no impact has been identified on protected sites and species during this timeframe. Table A1 - 6.17 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the defences will continue to be maintained therefore the impacts that have been identified are largely the same as those identified in the short term.

Negative impacts have also been identified on sediment, geology, and geomorphology (coastal processes) as the presence of defences will prevent natural coastal processes from taking place, reducing the volume of the beach particularly in the south. This will also have a negative effect on coastal flooding associated with the loss of the natural protection provided by the beach. Both positive and negative impacts have been identified on protected sites and species as the integrity of North Denes SSSI will be maintained behind the seawall, however there could be possible losses to the SPA area on the seaward side due to system retreat within this timeframe. In addition to the impacts on the SPA and SSSI, the rise in sea level and the maintenance of the defences along the estuary channel could alter the sediment flow into Breydon Water potentially having a negative impact on Breydon Water SPA and SSSI. Table A1 - 6.17 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

In the long term the impacts will be the same as those identified in the medium term. Potential adverse impacts have been identified on protected sites and species due to further potential losses to the SPA area on the seaward side and further impacts on Breydon Water SPA and SSSI due to sediment transfer if the defences along the estuary are maintained. However there are also potential beneficial impacts on protected sites species as North Denes SSSI will continue to be maintained behind the seawall.

There is also the potential for negative impacts on coastal activities as by this timeframe the beach to the south would be lost, this could potentially reduce the number of visitors to the area which in turn could impact on the local tourist economy. This could also impact on physical and mental wellbeing caused by increase stress and anxiety to the people that rely on the tourist trade. If the tourist and recreation industry is effected properties could also potentially become empty and abandoned which would have impacts on the built landscape as well. Table A1 - 6.17 in Appendix 1.1 presents a full summary of these results.

#### Impact on policy unit 6.17 – Great Yarmouth if there were no active intervention

If the policies were not implemented the seawall and groynes would fail in the medium term resulting in a high risk of property loss and flooding in both the medium and long term.

8.1.18

6.18 – Gorleston

#### Current situation

At present the whole of this section is provided by a sloping seawall and groynes. A harbour arm is also present at the entrance to the port. The seawall and harbour arm both have residual lives of around 20 years and the groynes <5-10 years.

### Continuation of present management

If present management were to be continued in the short term there would be little change to the shoreline. In the medium term the beach would become narrower due to sea level rise and the restriction of the landward movement due to the seawall. In the long term there would be a narrow steep beach present in the shelter of the harbour arm, the seawall would potentially need to be ungraded as well as an extension of the defences to prevent outflanking due to cutback at the southern end.

### Preferred policy

The long term policy for this unit is to continue to protect the assets as it is an important residential, commercial and tourist centre and its position on the coast means that it has little influence over the coastal activities elsewhere.

The policy of the short, medium and long term timeframes is to hold the existing line.

### Results of the assessment of the preferred policy option in the Short Term

No significant adverse or beneficial impacts have been identified in the short term. The seawall, harbour arm and reef will be maintained, there will be little change to the coastline. The maintenance of the defences will have positive impacts on coastal and material assets and physical and mental wellbeing due to the protection of property. There will also be a positive impact on adapting to climate change as holding the existing line will defend the town against sea level rise and flooding. There could be temporary adverse impacts on noise and vibration if any construction is required to maintain the integrity of the defences. Table A1 - 6.18 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the defences will continue to be maintained, the impacts will largely be the same as those identified in the short term with no significant adverse or beneficial impacts being identified. There would also be negative impacts on sediment, geology, and geomorphology (coastal processes) due to the continued prevention of natural coastal processes and the narrowing of the beach which in turn will also impact on the natural landscape and coastal flooding due to a reduction in the natural defence provided by the beach. Table A1 - 6.18 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

No significant adverse or beneficial impacts have been identified in the long term. However, there would be further impacts on sediment, geology, and geomorphology (coastal processes) due to the maintenance of the defences and the beach becoming narrower. There could also be negative impacts on activities and industries due to the narrowing of the beach; this could potentially reduce the number of visitors to the area which in turn would affect the local tourist economy which would also have a negative impact on physical and mental wellbeing on people that rely on this industry. If this occurred it could result in tourist facilities and properties becoming empty or abandoned, resulting in a negative impact on the built landscape and townscape. Table A1 - 6.18 in Appendix 1.1 presents a full summary of these results.

### Impact on policy unit 6.18 – Gorleston if there were no active intervention

If the policy were not implemented the groynes would fail in the short term and the seawall would fail in the medium term. This would result in the loss of a significant amount of residential and commercial properties, community, recreational and tourist facilities and loss of services and infrastructure including some important heritage sites. This loss would continue in the long term.

8.1.19

6.19 – Gorleston to Hopton

### Current situation

At present the entire length is fronted by a timber revetment which is semi buried and a number of groynes are present along this stretch. The revetment has a residual life of <15 years and the groynes <5-10 years.

### Continuation of present management

If present management were continued in the short term the cliffs will continue to erode at a similar rate to present, the beach will be similar to present but may be narrowed due to insufficient sediment supply. In the medium term the rate of erosion may increase due to sea level rise and the revetment and groynes would need to be rebuilt in a retreated position. In the long term the revetment and groynes would need to be rebuilt in a retreated position as landward erosion increases. Retention of the shorelines to the north and the south could potentially result in this policy unit becoming an embayment.

### Preferred policy

The long term plan is to allow the cliffs to retreat and a naturally functioning coastline to develop in order for sediment to be sourced from cliff erosion and transported along this frontage.

The short, medium and long term policy for this unit is for no active intervention.

**Table 8.19: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.19**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓

### Results of the assessment of the preferred policy option in the Short Term

In the short term the timber revetment and groynes would be maintained until they fail. No significant adverse or beneficial impacts have been identified on this policy unit during this timeframe.

There will be loss to some of the Gorleston Golf Course land which could have slight negative impacts on activities and industries as it could potentially reduce the number of visitors to course. There could also be an impact on physical and mental wellbeing due to stress and anxiety on the owners and any employees of the golf course in relation to the potential for the loss of earnings. Table A1 - 6.19 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Medium Term

No significant adverse or beneficial impacts have been identified in the medium term.

The timber revetment and groynes would be allowed to fail, there would be further loss to the golf course land further impacting on the area identified in the short term. The deterioration of the defences will allow for a naturally functioning coastline to develop having a positive impact in sediment, geology, and geomorphology (coastal processes) and the natural landscape. The maintenance of the beach due to the lack of defences will also have a positive impact on coastal flooding as this will act as a natural defence. Table A1 - 6.19 in Appendix 1.1 presents a full summary of these results.

### Results of the assessment of the preferred policy option in the Long Term

In the long term there would be no defences present which would result in a beneficial impact on substrate. No significant adverse impacts have been identified.

There would also be further loss of the golf course land. The impacts identified would be the same as those identified in the medium term. Table A1 - 6.19 in Appendix 1.1 presents a full summary of these results.

## 8.1.20

### 6.20 – Hopton

### Current situation

At present the northern section is fronted by a timber revetment which is semi buried and the southern section is fronted by a sloping concrete seawall. The whole stretch has timber

groynes. The residual life of the seawall is around 20 years, the timber revetment <15 years and the groynes <5-10 years.

#### Continuation of present management

If present management were to continue the cliffs would be held in their present position in the south by the seawall and the groynes would maintain a narrow beach. In the medium term the beach would become narrower due to sea level rise and the prevention of landward movement due to the seawall. In the long term the seawall would require regular maintenance to protect its integrity and there would be cutback at either end which could require the defence to be extended. There would be no beach present which could accelerate erosion to the south through the trapping of sediment.

#### Preferred policy

The long term policy is for retreat to improve sediment input and throughput.

The short term policy is hold the line and only when such adequate mitigating social measures are in place to limit the impact on the lives of the individuals and the community would the change to no active intervention in the medium and long term be implemented.

**Table 8.20: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.20**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	x	✓	✓✓
Built landscape and townscape	x	x	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	x	xx	xx

#### Results of the assessment of the preferred policy option in the Short Term

In the short term the defences would be maintained and holding the line will prevent the loss of residential and commercial properties. No significant adverse or beneficial impacts have been identified during this timeframe.

There would, however, be loss to holiday village accommodation and services. This will result in negative effects on material assets and activities and industries, due to the impact on the tourist industry as well as impacts on physical and mental wellbeing for owners of the holiday accommodation and potentially any employees of the village. There will also be negative effects on the sediment, geology, and geomorphology (coastal processes) as the defences will prevent a naturally functioning coastline and potentially temporary negative impacts on noise and air quality where construction is required to maintain the defences. Table A1 - 6.20 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the seawall and groynes will be allowed to deteriorate and fail. This will result in the loss of residential properties, further loss of the holiday village and loss of tourist facilities associated with the holiday village. This will result in adverse impacts on material assets, activities and industries and physical and mental wellbeing.

Impacts on sediment, geology, and geomorphology (coastal processes) and the natural landscape will become positive as a more natural coastline will be able to function. There is the potential for an impact on water quality associated with the loss of services with the properties. Table A1 - 6.20 in Appendix 1.1 presents a full summary of these results.



### Results of the assessment of the preferred policy option in the Long Term

In the long term there will be no defences present resulting in further loss of seafront houses, holiday village accommodation and tourism and recreation facilities along the coastal strip further impacting on material assets, activities and industries and physical and mental wellbeing. The loss of property will also have an adverse effect on the built landscape. There will be a beneficial impact on sediment, geology, and geomorphology (coastal processes) as the loss of the defences will allow for natural coastal processes to take place.

There will be further positive effects on sediment, geology, and geomorphology (coastal processes) and the natural landscape as well as coastal flooding as the presence of the beach will provide a natural level of protection. Table A1 - 6.20 in Appendix 1.1 presents a full summary of these results.

### Impacts on policy unit 6.20 – Hopton if there were no active intervention in the short term

The impacts of the preferred policy and no active intervention will be the same, however the implementation of the preferred policy will delay the loss of property allowing sufficient time for adequate mitigating social measures are put in place to limit the impact on the lives of the individuals and the community.

## 8.1.21

### 6.21 – Hopton to Corton

#### Current situation

At present the seawall which spans the Corton / Hopton boundary extends to protect the northern section of this unit including the ex MOD site. To the south of the wall the cliffs are fronted by timber revetment and groynes are present along this stretch. The residual life of the seawall is <5 years, (a section of which failed in 2009), the timber revetment steel piling is holed and the groyne field is substantially derelict.. There is a rock revetment in the southern most part of this policy unit.

#### Continuation of present management

If the defences along this section were maintained the cliffs would erode at a similar rate and there would be some narrowing of the beach. In the medium term the revetment and groynes would need to be rebuilt in a retreated position and there would be further narrowing of the beach. In the long term the revetment and groynes would need to be rebuilt, however the narrowing of the beach would slow due to this section becoming an embayment.

#### Preferred policy

The long term plan for this section is to allow retreat enabling a naturally function coastline.

The short, medium and long term policy for this unit is for no active intervention.

**Table 8.21: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.21**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	x	x	xx

### Results of the assessment of the preferred policy option in the short term

In the short term the timber groynes and revetment would be allowed to fail which would result in the loss of farmland. No significant adverse or beneficial impacts have been identified during this timeframe.

Negative effects on coastal activities and industries and physical and mental wellbeing attributed to stress and anxiety with the loss of land have been identified. Table A1 - 6.21 in Appendix 1.1 presents a full summary of these results.

Results of the assessment of the preferred policy option in the Medium Term

In the medium term there would not be any defences present which would result in further loss of farmland and some loss to the edge of the holiday centre site. This would have further impacts on farming in the local area and on the recreation and tourism industry resulting in adverse impacts on coastal activities and industries. However the loss of the defences by this timeframe could improve access to the beach which may have a slight positive impact on coastal activities. Within this timeframe the MOD bunker will become more exposed having a negative impact on the natural landscape and seascape. Beneficial impacts on sediment, geology, and geomorphology (coastal processes) have been identified as this section of the coastline would be able to function naturally.

There would be positive impacts on the natural landscape as the coast will be able to function naturally. There would also be a positive effect on coastal flooding as the naturally functioning coastline will enable the beach to be maintained which will provide a degree of natural defence. Table A1 - 6.21 in Appendix 1.1 presents a full summary of these results.

Results of the assessment of the preferred policy option in the Long Term

In the long term there would be further loss of farmland and loss to the holiday centre site further impacting on the coastal activities and industries and also having an adverse impact on physical and mental wellbeing. The beneficial impact on sediment, geology, and geomorphology (coastal processes) would continue into this timeframe.

There is potential for a section of the pumping station site to be lost and if not appropriately controlled could have a negative effect on coastal water quality. The lack of defences will allow for the continuation of a naturally functioning coastline maintaining the positive effects on coastal flooding and the natural landscape. Table A1 - 6.21 in Appendix 1.1 presents a full summary of these results.

8.1.22

6.22 – Corton

Current situation

At present at Corton there is a rock revetment along the northern 2/3 of this policy unit which fronts a concrete seawall. The residual life of the Seawall is approximately 20 years.

Continuation of present management

If present management were to continue in the short term the cliffs would be held in their current position by the seawall and the beach would of almost disappeared completely along the northern 2/3 of the policy unit, however the beach should remain along the southern, ¼ of policy unit in the short term. In the medium term, work would be required to maintain the integrity of the defences due to increased wave exposure and sea level rise. There would be erosion either side of the seawall therefore work would be required to extend the defences to prevent outflanking. This area would also prevent the transport of sediment from north to south which would accelerate the erosion in the south. In the long term the defences would require significant work in order to maintain them.

Preferred Policy

The long term plan for this section of the coastline is to allow retreat to allow a more natural shoreline position to be attained as continuing to maintain defences will prevent transport of sediment to the south having detrimental impacts on Gunton Warren and Lowestoft.

The preferred policy in the short term is to hold the line and only when such adequate mitigating social measures are identified to limit the impact on the lives of individuals and the community, would the long term change to a managed realignment policy in the medium and long term be implemented.

**Table 8.22: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.22**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	x	✓	✓✓
Historic environment and archaeology	=	xx	xx
Built landscape and townscape	-	x	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	-	xx	xx

#### Results of the assessment of the preferred policy option in the Short Term

In the short term the seawall and rock revetment will be maintained therefore there will be no loss of property, land or facilities and in turn no significant adverse impacts have been identified. The retention of the defence to 2025 will squeeze the beach and limit public shoreline access opportunity.

There is potential for temporary negative effects on noise and air quality if the maintenance of the defences require any construction works. The maintenance of the defences will also have negative impact on sediment, geology, and geomorphology (coastal processes) as they would limit the transfer and result in coastal squeeze which in turn could reduce public access to the beach and have minor impacts upon coastal activities and industries.. A negative impact on protected sites and species has been identified as exposure of the designated cliffs would continue to be prohibited by the presence of the defences in this timeframe.. Table A1 - 6.22 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Medium Term

In the medium term the seawall and rock revetment would be allowed to deteriorate and fail / be removed. This would result in loss of residential and commercial properties which would have an adverse impact on material assets and physical and mental wellbeing as well as industries connected with the loss of the commercial properties and facilities. Seafront holiday camps will also be lost which will further impact on the local tourism industry and stress and anxiety of the people associated with this industry. Corton Church which is of high archaeological importance will potentially be lost having an adverse impact on the historic environment and archaeology.

The loss of property will also result in a negative impact on the built landscape and townscape in the area. There would be loss to a section of the main road through the village which will affect access in the area as well as access of surrounding villages and communities. The failure of the defences will allow for a more naturally functioning coastline to develop this will have a positive effect on sediment, geology, and geomorphology (coastal processes) and the natural landscape. There will be a positive impact on protected sites and species during this timeframe as the loss of the defences will allow Corton Cliffs SSSI to be exposed. Table A1 - 6.22 in Appendix 1.1 presents a full summary of these results.

#### Results of the assessment of the preferred policy option in the Long Term

In the long term there would be no defences present and this would result in further property loss as well as a number of key community facilities within the village. The impacts would be the same as those that were identified in the medium term, however the impacts, both positive and negative, are likely to be more pronounced. Table A1 - 6.22 in Appendix 1.1 presents a full summary of these results.

#### Impact on policy unit 6.22 – Corton if there were no active intervention

If there were no active intervention the seawall would fail during the medium term. The impacts would be similar to those identified for the preferred policy however would occur sooner and

unmanaged. This would not allow sufficient time to implement adequate mitigating social measures to limit the impact on the lives of individuals and the community.

### 8.1.23

#### 6.23 – Corton to Lowestoft

##### Current situation

At present the cliffs at the northern end are protected by a concrete seawall which is set back behind the beach and there are timber groynes along the whole frontage. The residual life of the seawall is approximately 20 years and the groynes <5-10 years.

##### Continuation of present management

If present management were to continue the sand cliffs and dunes would become increasing exposed in the short term due to the narrowing of the beach from reduced sediment supply from the north. In the medium term the narrowed beach will result in the loss of some of the vegetated dune system and sand cliffs. The groynes would need to be rebuilt in a retreated position. In the long term the cliffs would erode and the groynes would need to be reconstructed, however this area would form an embayment which would aid in stabilising the area in the long term.

##### Preferred policy

The long term plan for this unit is to allow retreat and in doing so aid a naturally functioning coastline.

The short, medium and long term policy for this unit is no active intervention.

**Table 8.23: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.23**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	xx	xx
Ecosystems and biological diversity	x	xx	xx
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Water quality	x	x	xx

##### Results of the assessment of the preferred policy option in the Short Term

In the short term the timber groynes would be allowed to fail, however no significant adverse or beneficial impacts have been identified during this timeframe.

There would be some deterioration to the dune system and the CWS which could potentially have a negative impact on protected sites and species as well as tourism and recreation in the area. There is also the potential for damage to pipelines which in turn will have negative impacts on material assets and potentially coastal water quality. Table A1 - 6.23 in Appendix 1.1 presents a full summary of these results. There is the potential for a negative impact on water quality towards the end of this timeframe if the Eleni V oil dump is allowed to erode unmitigated.

##### Results of the assessment of the preferred policy option in the Medium Term

By the medium term the groynes would have failed and no defences would be present. There would be further loss of the dunes and CWS further impacting on protected sites and species and ecosystems and biological diversity. The loss of the defences would allow a naturally functioning coastline to develop having a beneficial impact on substrate. There is the potential for an adverse impact on water quality as the risk of the old oil dump being exposed would be high..

The lack of defences would result in the coastline functioning more naturally therefore having positive impacts on the natural landscape. Table A1 - 6.23 in Appendix 1.1 presents a full summary of these results.

Results of the assessment of the preferred policy option in the Long Term

The impacts in the long term will largely be the same as those identified in the medium and short terms. Table A1 - 6.23 in Appendix 1.1 presents a full summary of these results.

8.1.24

6.24 – Lowestoft North (to Ness Point)

Current situation

At present there is a concrete seawall, promenade and second splash wall. At Lowestoft Ness there is also further defence through rock armouring. The residual life of the seawall in the north is approximately 20 years and the seawall in the south, approximately 50 years.

Continuation of present management

If current management were to continue the seawall will prevent erosion to the hinterland in the short term, however the current beach is expected to disappear due to reduced sediment supply and increased wave exposure. In the medium term the seawall will continue to prevent erosion, however it may require significant work to maintain its integrity. In the long term the seawall is likely to require regular maintenance, there would still be no beach as any material which is transported to this area is likely to be lost offshore.

Preferred policy

The long term plan is to continue to defend the assets within the town.

The short, medium and long term plan for this unit is to hold the existing line.

**Table 8.24: Summary of significant adverse and beneficial impacts of the preferred policy on Policy Unit 6.24**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	x	x	xx
Coastal flooding	x	x	xx
Natural landscape and seascape	-	x	xx

Results of the assessment of the preferred policy option in the Short Term

In the short term the seawall will be maintained, no significant adverse or beneficial impacts have been identified during this time period.

During this timeframe no properties would be lost having positive impacts on coastal material assets and physical and mental wellbeing as any stress and anxiety associated with potential property loss will be reduced. The maintenance of the defences could potentially have temporary negative impacts on noise and air quality if any construction is required. There will also be negative impacts on sediment, geology, and geomorphology (coastal processes) as the maintenance of the defences will prevent a naturally functioning coastline and the beach is likely to have disappeared in this timeframe. This in turn will have a negative effect on coastal flooding as there will be no natural protection provided by the beach. Table A1 - 6.24 in Appendix 1.1 presents a full summary of these results.

Results of the assessment of the preferred policy option in the Medium Term

In the medium term the seawall will continue to be maintained and the impacts will be similar to those identified in the short term with no significant adverse or beneficial impacts being identified.

There would also be negative impacts on the natural landscape due to the loss of beach and the maintenance of the defences. The loss of the beach could also result in a negative effect on activities and industries, as the number of visitors to the area may reduce impacting on the local tourism industry. Table A1 - 6.24 in Appendix 1.1 presents a full summary of these results.

*Results of the assessment of the preferred policy option in the Long Term*

In the long term the seawall will continue to be maintained. This will result in similar impacts to those that have already been identified though impacts on sediment, geology, and geomorphology (coastal processes) and coastal flooding and the natural landscape may be more pronounced.

There is potential for an impact on the tourism industry due to the loss of the beach which may also result in a negative impact on physical and mental wellbeing due to stress and anxiety of people that rely on this industry. This too could have knock on impacts on the built landscape if properties associated with the industry begin to close or become abandoned. Table A1 - 6.24 in Appendix 1.1 presents a full summary of these results.

*Impacts on policy unit 6.24 – Lowestoft North (to Ness Point) if there were no active intervention*

If there were no active intervention the seawall would remain in the short and medium timeframes but fail in the long term. This would result in the loss of properties, increased risk to infrastructure, loss of link roads, flood and erosion risk to the recreation ground and promenade, loss of or damage to heritage sites and open space due to flooding, risk of exposure of a household waste tip and loss of Euroscope which marks the most easterly point in England.

# 9 Cumulative Effects

## 9.1 Introduction

This sections looks at the cumulative effect of the assessment on each of the key areas under the SEA Directive topics across the entire length of the SMP area in order to assess the overarching effects of the SMP.

Cumulative impacts can also be secondary or synergistic for example the loss of a beach could result in a reduction in visitor numbers and thus an adverse effect on the local economy. These impacts have been included within the assessment and are discussed within sections 8.1.1 to 8.1.24 within Chapter 8.

### 9.1.1 *Coastal Protected sites and species*

The impact on protected sites and species in the short, medium and long term has been illustrated on Diagram 1. Generally the impact of the SMP on the protected sites that are located along the coastline will be beneficial. Where defences are allowed to deteriorate and fail this will increase the exposure of a number of SSSIs cliffs which are designated for their exposure.

#### Results of the assessment on protected sites and species in the Short Term

In the short term very few negative impacts on coastal protected sites and species have been identified. Within policy unit 6.02 – Sheringham, defences will be maintained resulting in poor exposure of Beeston Cliffs SSSI and within policy unit 6.10 – Bacton Gas Terminal the hold the line policy will also result of poor exposure of the designated cliffs. Within 6.14 – Winterton-on-Sea the no active intervention policy will result in some erosion of Hemsby Marram Dunes.

#### Results of the assessment on protected sites and species in the Medium Term

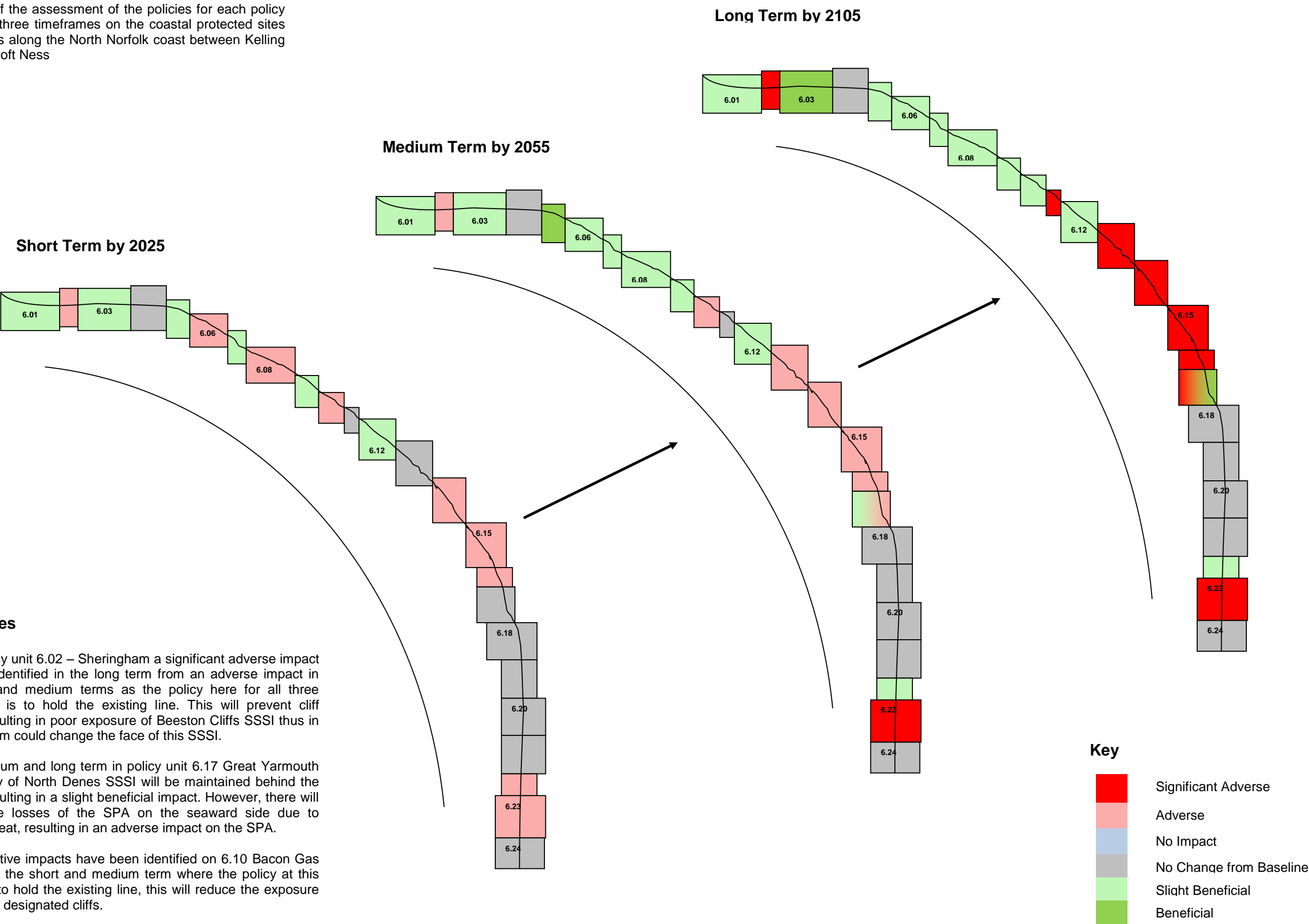
In the medium term the three policy units identified in the short term will be further impacted upon. In addition the maintenance of the defences within policy units 6.16 – Caister-on-Sea and 6.17 – Great Yarmouth will result in steepening of the beach, potentially reducing the area for tern nesting which could have an impact on the SPA designation.

#### Results of the assessment on protected sites and species in the Long Term

In the long term the Beeston Cliffs SSSI will continue to be impacted upon, however the policy at 6.10 – Bacton Gas Terminal will have changed to be managed realignment at this timeframe allowing for exposure of the cliffs to re-establish. The impacts on policy units 6.14, 6.16 and 6.17 will continue.

Diagram 1 Protected Sites and Species

Overview of the assessment of the policies for each policy unit at the three timeframes on the coastal protected sites and species along the North Norfolk coast between Kelling and Lowestoft Ness





### 9.1.2 *Ecosystems and biological diversity*

The impact on ecosystems and biological diversity for the short, medium and long term has been presented in Diagram 2. Generally the impact on this topic will be low as the long term policy for the majority for the SMP area is to allow retreat thus enabling a naturally functioning coastline to develop.

#### *Results of the assessment on ecosystems and biological diversity in the Short Term*

In the short term there will be some loss to of habitats at Kelling Hard and Beach Lane including the County Wildlife Sites (CWS) within policy unit 6.01 – Kelling Hard to Sheringham. Between Overstrand and Mundesley, 6.07 there will possibly be a loss of cliff top habitats due to coastal squeeze. The hold the line policy at policy unit 6.10 – Bacton Gas Terminal could possibly be detrimental on habitats due to the presence of the defences. There is likely to be erosion of Hemsby Marram Dunes which are located within policy unit 6.14 – Winterton to Scratby and minimum loss to the habitats within policy unit 6.15 – California to Caister-on-Sea. There will also be loss of habitats at Gunton Warren including the CWS in policy unit 6.23 – Corton to Lowestoft.

#### *Results of the assessment on ecosystems and biological diversity in the Medium Term*

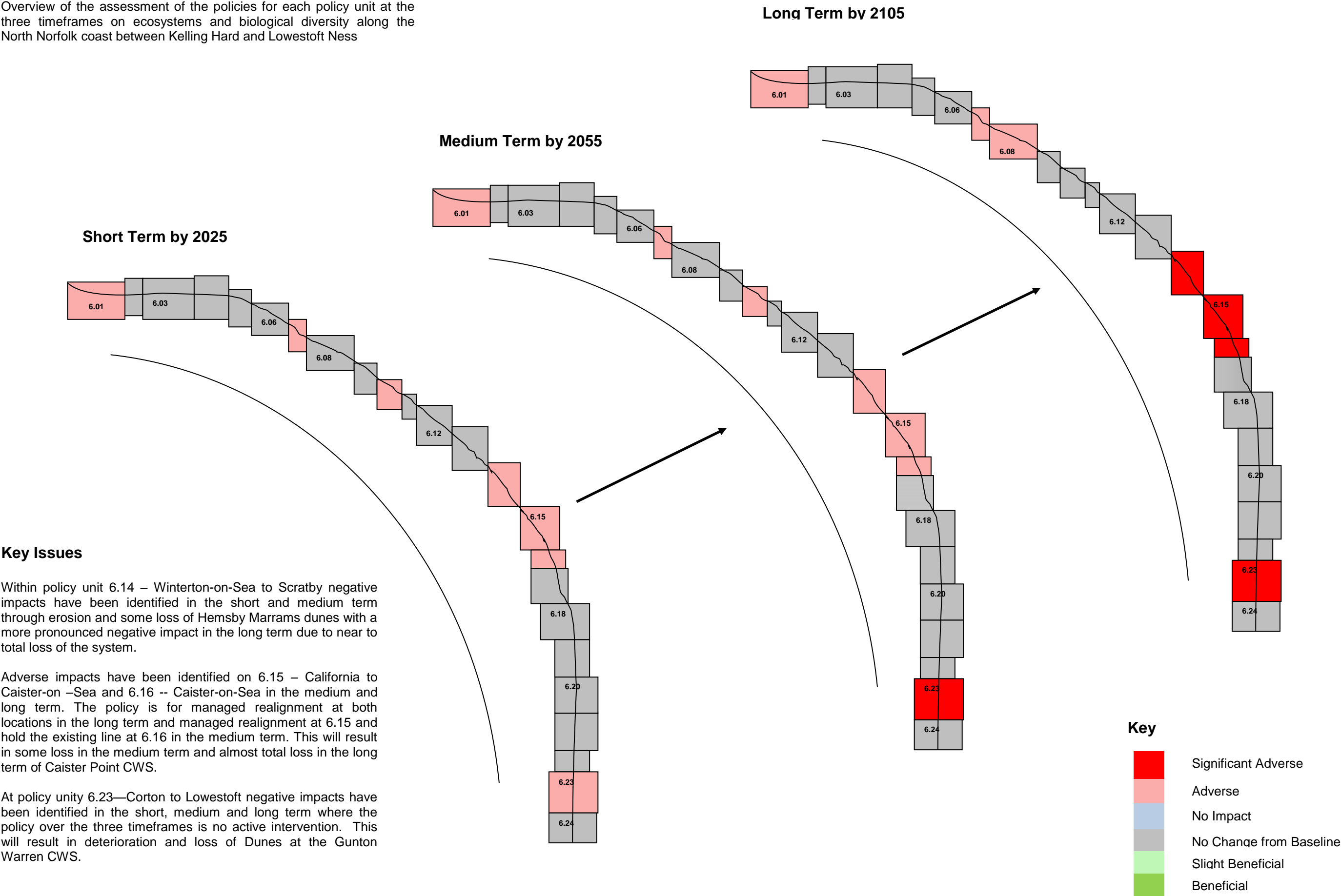
In the medium term there will be further loss to those sites that have been identified in the short term which will result in more pronounced impacts, in particular on habitats at Gunton Warren including the CWS. There will also be a negative impact at policy unit 6.16 – Caister-on-Sea as some habitats at the northern end of Caister Point including a section of the CWS will be lost.

#### *Results of the assessment on ecosystems and biological diversity in the Long Term*

In the long term the negative impacts on those site indentified in the short and medium term will become more pronounced, in particular impacts on Hemsby Marram Dunes, the habitats within policy unit 6.15 and Caister Point including the CWS. There could also be an impact on policy unit 6.08 – Mundesley as there will be some loss cliff top grassland including some of the CWS. However the negative impact on policy unit 6.10 – Bacton Gas Terminal caused by the presence of defences will be reduced due to the failure of these defences at this timeframe.

Diagram 2 Ecosystems and Biological Diversity

Overview of the assessment of the policies for each policy unit at the three timeframes on ecosystems and biological diversity along the North Norfolk coast between Kelling Hard and Lowestoft Ness



### 9.1.3 *Sediment, geology, and geomorphology (coastal processes)*

The impact on sediment, geology, and geomorphology (coastal processes) for the short, medium and long term has been illustrated on Diagram 3. Impacts on sediment, geology, and geomorphology (coastal processes) along the coastline will be mixed. Where the policies are for no active intervention and managed realignment a naturally functioning coastline would be allowed to form, having positive impacts on substrate. Where the policies are to hold the line there will generally be a negative effect on sediment, geology, and geomorphology (coastal processes) as natural coastal process will be prohibited.

#### *Results of the assessment on sediment, geology, and geomorphology (coastal processes) in the Short Term*

In the short term, generally there will not be a significant change to the baseline situation along the coastline. There will be some negative impacts on the policy units where the policy is to hold the line.

#### *Results of the assessment on sediment, geology, and geomorphology (coastal processes) in the Medium Term*

In the medium term the impacts on sediment, geology, and geomorphology (coastal processes) will be more pronounced. Within policy the units where the policy is for managed realignment and no active intervention there will be beneficial impacts on sediment, geology, and geomorphology (coastal processes) as any existing defences which were still present during the short term would have, or be allowed to fail. This would result in the natural erosion to take place and this sediment to be naturally transported along the coast. At the centres of industry and commerce within the SMP area such as Cromer and Great Yarmouth there would continue to be negative impacts the defences would continue to be maintained. There would also be impacts at policy units such as Caister-on-Sea where the long term policy is for managed realignment as sediment supply from this location is essential for the integrity of the whole SMP area but until appropriate social mitigation is identified the policy will be to hold the line preventing the release of this sediment.

#### *Results of the assessment on sediment, geology, and geomorphology (coastal processes) in the Long Term*

In the long term there will be positive impacts along the majority of the coastline with the only negative impacts being at the main centres of commerce, Sheringham, Cromer, Great Yarmouth, Gorleston and Lowestoft.

Diagram 3 Sediment, geology and geomorphology (coastal processes)

Overview of the assessment of the policies for each policy unit at the three timeframes on substrate along the North Norfolk coast between Kelling Hard and Lowestoft Ness

Key Issues

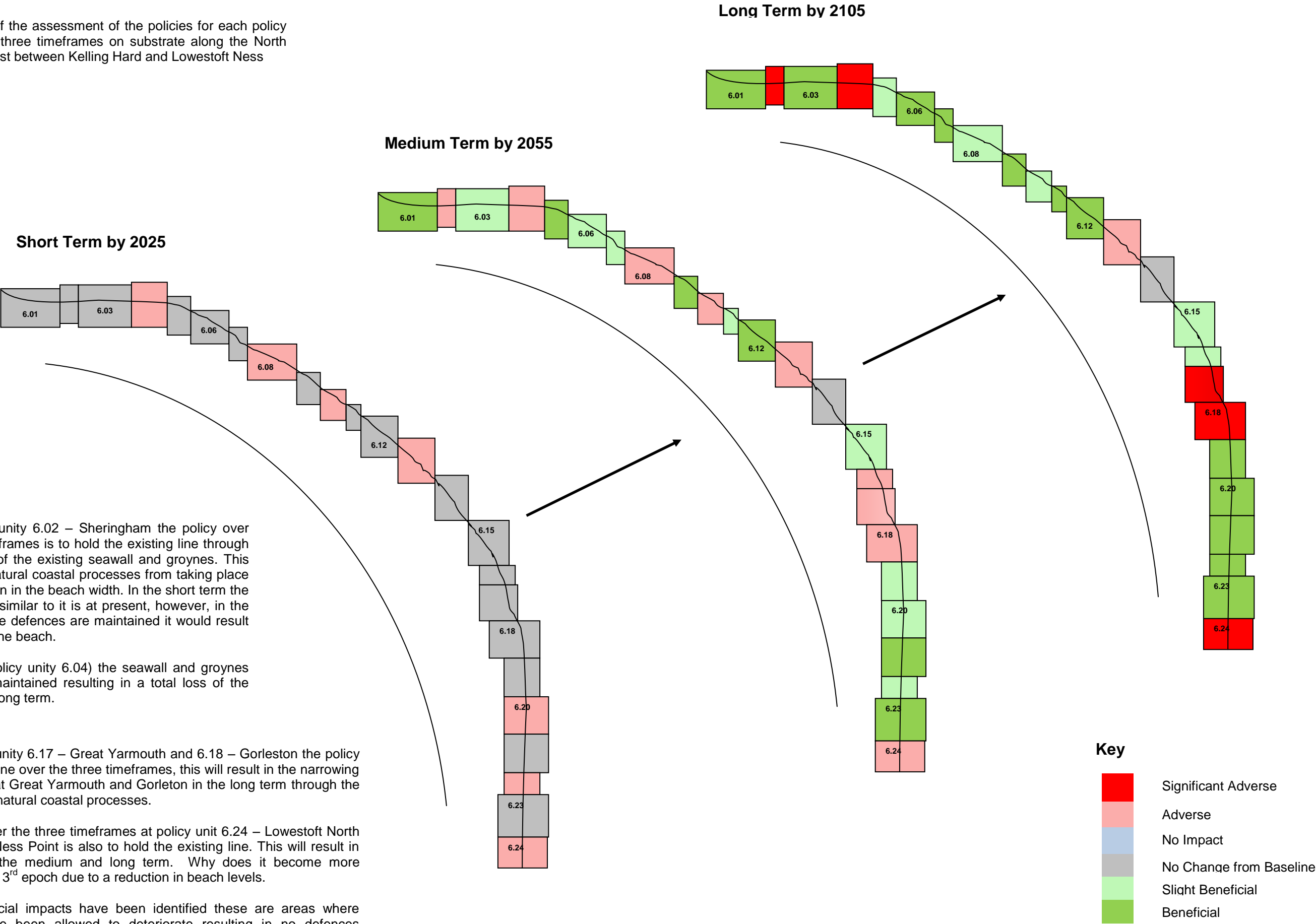
Within policy unit 6.02 – Sheringham the policy over the three timeframes is to hold the existing line through maintenance of the existing seawall and groynes. This will prevent natural coastal processes from taking place and a reduction in the beach width. In the short term the beach will be similar to it is at present, however, in the long term if the defences are maintained it would result in the loss of the beach.

At Cromer (policy unit 6.04) the seawall and groynes will also be maintained resulting in a total loss of the beach by the long term.

Within policy unit 6.17 – Great Yarmouth and 6.18 – Gorleston the policy is to hold the line over the three timeframes, this will result in the narrowing of the beach at Great Yarmouth and Gorleston in the long term through the prevention of natural coastal processes.

The policy over the three timeframes at policy unit 6.24 – Lowestoft North to Lowestoft Ness Point is also to hold the existing line. This will result in no beach in the medium and long term. Why does it become more adverse in the 3<sup>rd</sup> epoch due to a reduction in beach levels.

Where beneficial impacts have been identified these are areas where defences have been allowed to deteriorate resulting in no defences present at these policy units thus allowing natural coastal processes to take place along these sections of the coastline.



## 9.1.4

*Water Quality*

The impact on water quality for the short, medium and long term has been illustrated on Diagram 4. Generally potential negative impacts on water quality will occur in areas where there would be substantial loss of property and associated sewers if appropriate management is not implemented.

*Results of the assessment on water quality in the Short Term*

In the short term potential negative impacts have been identified where the policy is for either managed realignment or no active intervention and there is likely to be loss of services with properties.

*Results of the assessment on water quality in the Medium Term*

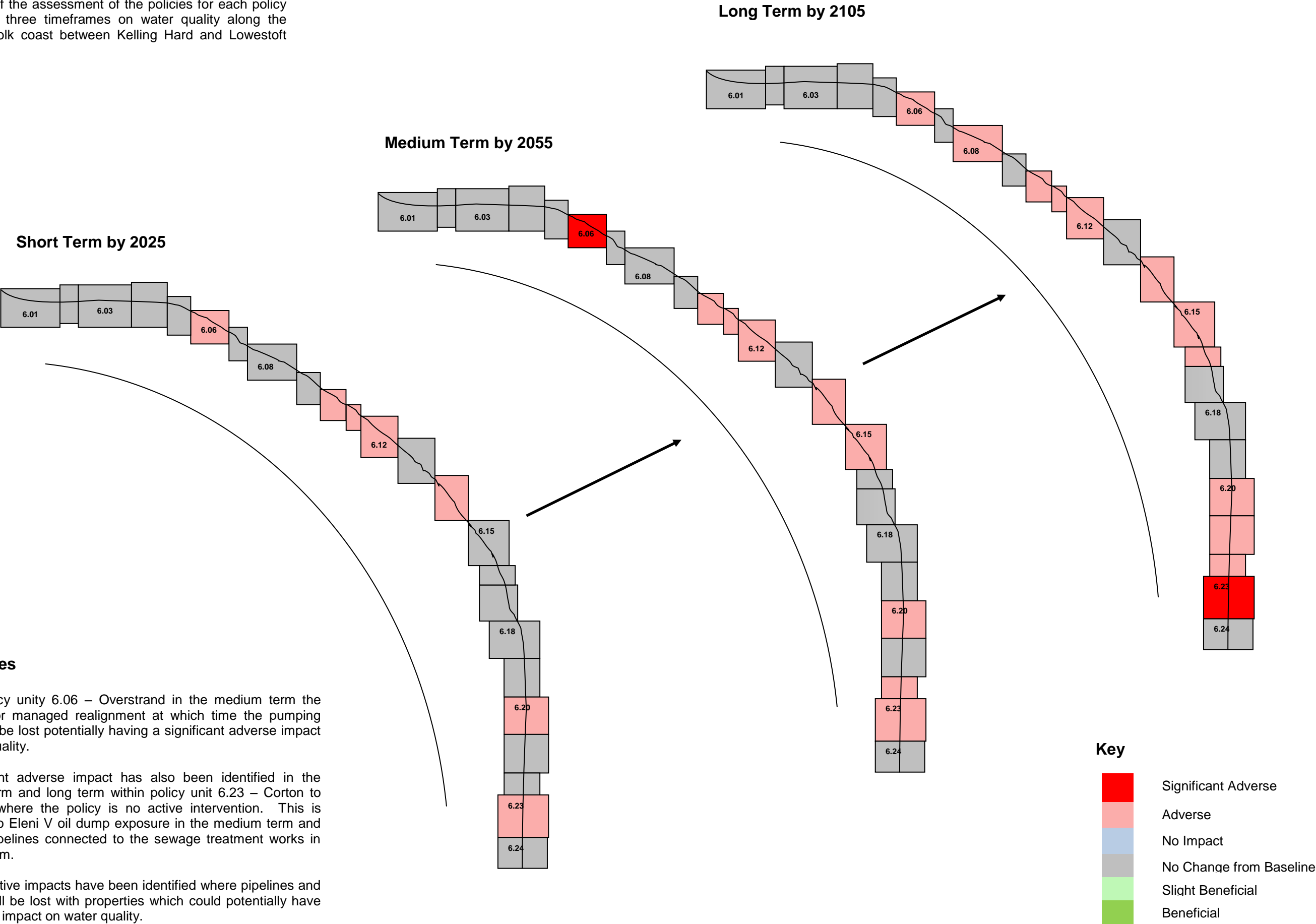
In the medium term it is predicted that a pumping station will be lost in policy unit 6.06 – Overstrand which if not appropriately controlled could have temporary significant adverse impacts on water quality. There is also potential for exposure of the Eleni V oil dump within policy unit 6.23 – Corton to Lowestoft, this could also have significant adverse impacts on water quality.

*Results of the assessment on water quality in the Long Term*

In the long term the impacts on water quality will continue at policy units where the policy is no active intervention or managed realignment due to further substantial loss of services with properties. Services in the main industrial and commercial centres will be protected by hold the line policies which will reduce the potential for significant adverse impacts. The oil dump will continue to be exposed between Corton and Lowestoft potentially having significant adverse impacts on the water environment at this location. In addition the pumping station in policy unit 6.21 Hopton to Corton could also be potentially lost during this timeframe which if not property controlled will have adverse impacts on surface water quality.

Diagram 4 Water Quality

Overview of the assessment of the policies for each policy unit at the three timeframes on water quality along the North Norfolk coast between Kelling Hard and Lowestoft Ness



## 9.1.5

*Coastal flooding*

The impact on coastal flooding for the short, medium and long term has been illustrated on Diagram 5. Generally the impact on coastal flooding along the coastline is positive as the long term plan for the majority of the SMP area is to allow for a naturally functioning coastline. This will allow the beaches to be continually replenished. The beaches will provide a natural protection to the coastline especially during storm events as they will allow for increased dispersion.

*Results of the assessment on coastal flooding in the Short Term*

In the short term there will be little change from the baseline situation as where policies are for managed realignment or no active intervention many of the defences will remain in place until the end of this timeframe. Negative impacts have been identified on those policy areas where the beaches are predicted to narrow during this period these are mainly to the south.

*Results of the assessment on coastal flooding in the Medium Term*

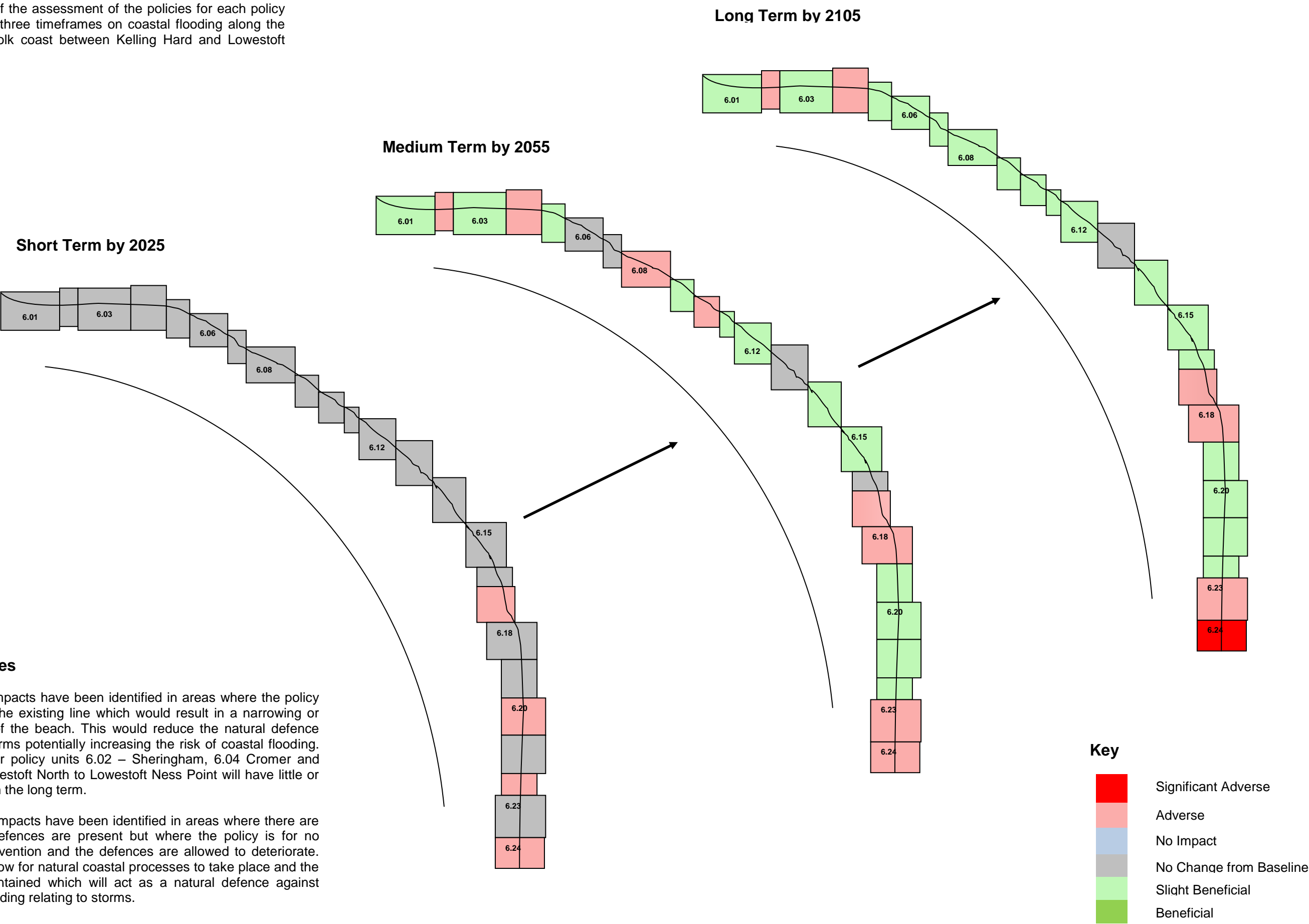
In the medium term where the defences have failed or are failing there will be positive impacts on coastal flooding as the beaches are maintained / replenished. There will be further negative impacts on areas where the beaches will become narrower these are mainly the areas where the defences will remain.

*Results of the assessment on coastal flooding in the Long Term*

In the long term the most significant negative impacts will be at policy units 6.04 – Cromer and 6.24 – Lowestoft north, where the maintenance of the defences and the protection of assets will result in the beach being lost and therefore increasing the exposure of the shoreline to increased wave intensity.

Diagram 5 Coastal flooding

Overview of the assessment of the policies for each policy unit at the three timeframes on coastal flooding along the North Norfolk coast between Kelling Hard and Lowestoft Ness





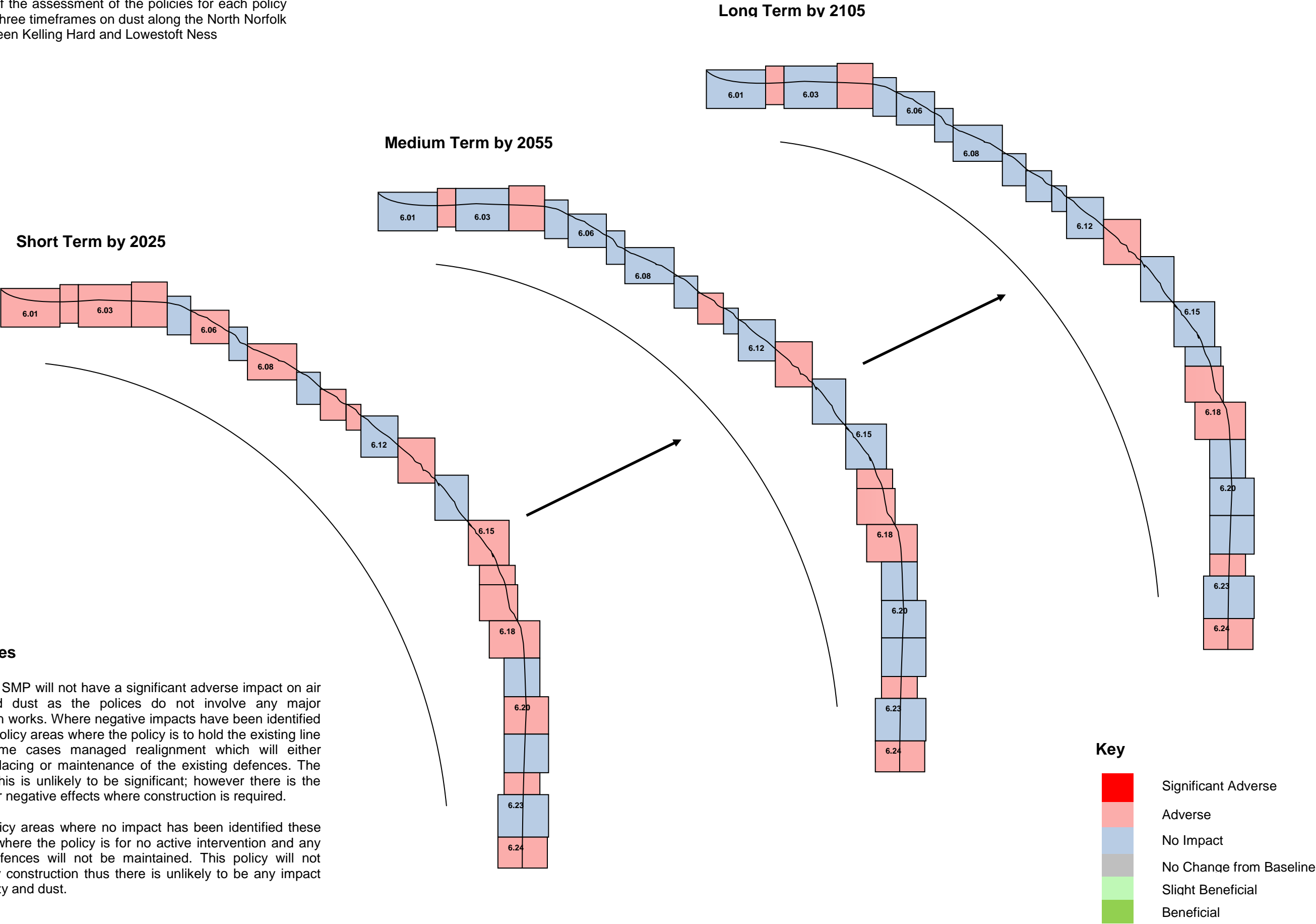
## 9.1.6

*Dust*

The impact on dust and air quality in the short, medium and long term has been illustrated on Diagram 6. The impacts on dust and air quality have been associated with any construction or maintenance that will be required in order to maintain the integrity of the coastal defences. Any impacts will be short term and temporary, however the frequency may increase in the long term if more regular maintenance is required.

Diagram 6 Dust

Overview of the assessment of the policies for each policy unit at the three timeframes on dust along the North Norfolk coast between Kelling Hard and Lowestoft Ness



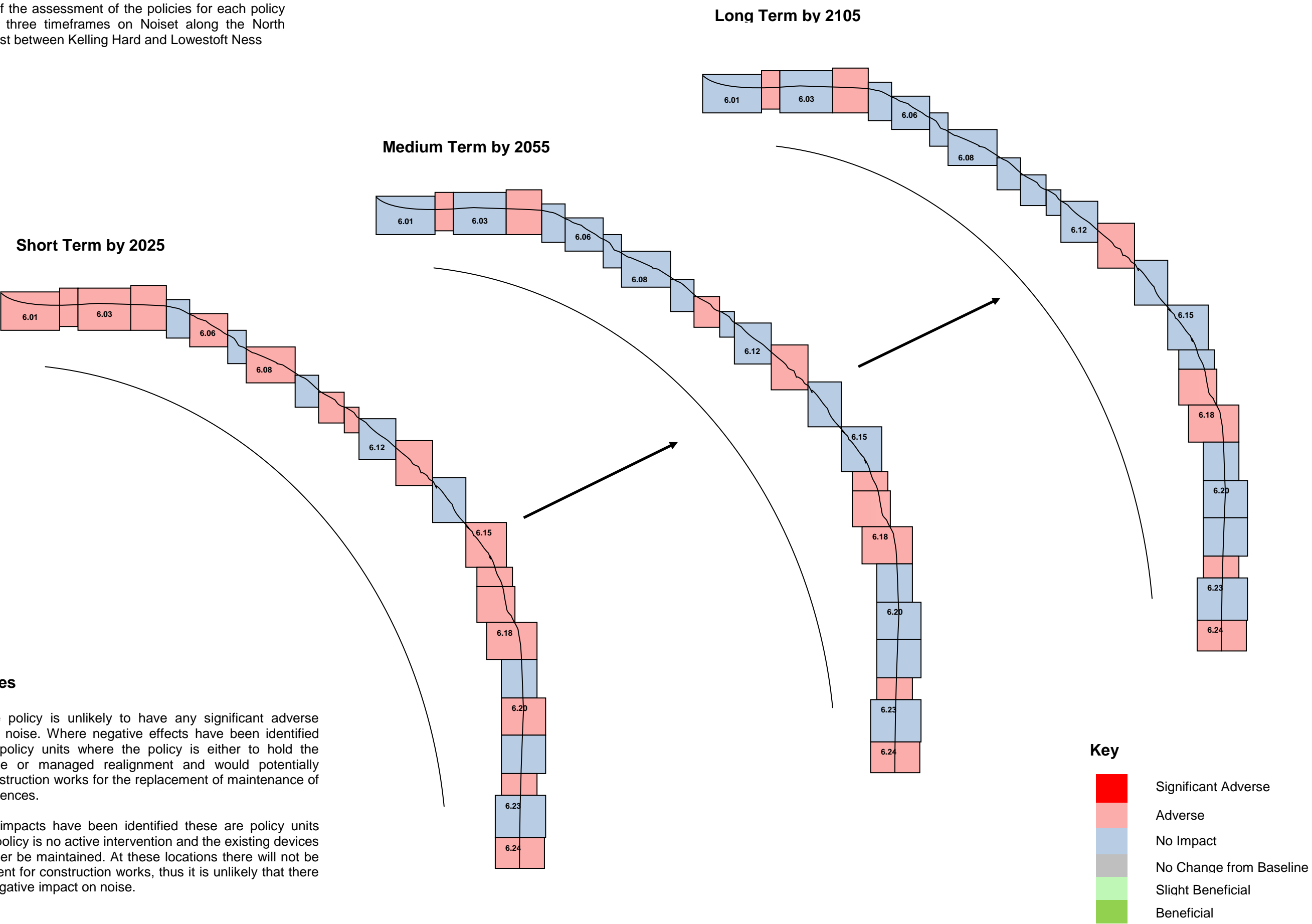
## 9.1.7

*Noise*

The impact on noise in the short, medium and long term has been illustrated on Diagram 7. The impacts on noise have been associated with any construction or maintenance that will be required in order to maintain the integrity of the coastal defences. Any impacts will be short term and temporary, however the frequency may increase in the long term if more regular maintenance is required.

Diagram 7 Noise

Overview of the assessment of the policies for each policy unit at the three timeframes on Noiset along the North Norfolk coast between Kelling Hard and Lowestoft Ness

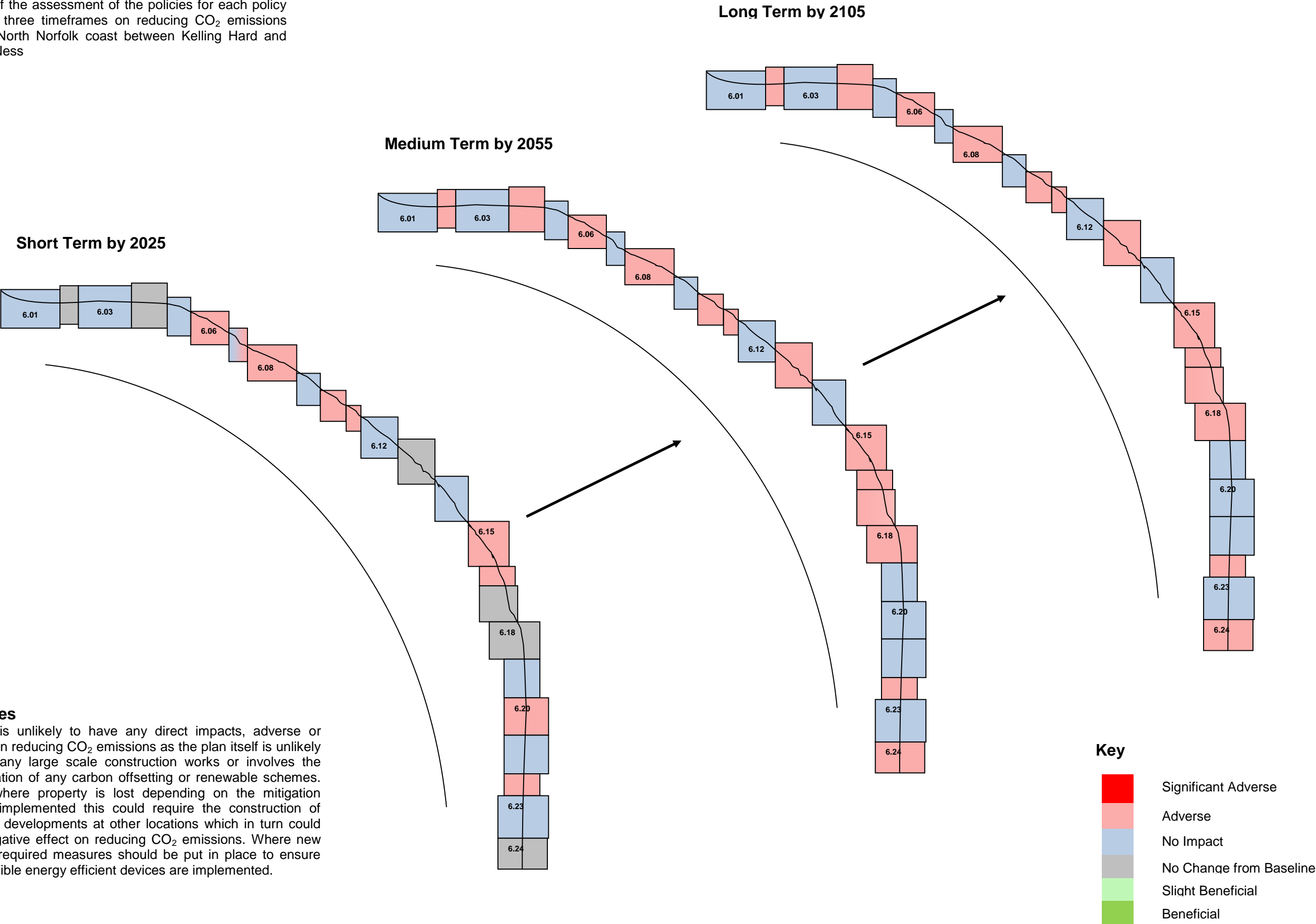


#### 9.1.8 *Reducing CO<sub>2</sub> emissions*

The policies contained within the shoreline management plan are unlikely to have any impact on reducing CO<sub>2</sub> emissions. This has been illustrated on Diagram 8.

Diagram 8 Reducing CO<sub>2</sub> Emissions

Overview of the assessment of the policies for each policy unit at the three timeframes on reducing CO<sub>2</sub> emissions along the North Norfolk coast between Kelling Hard and Lowestoft Ness



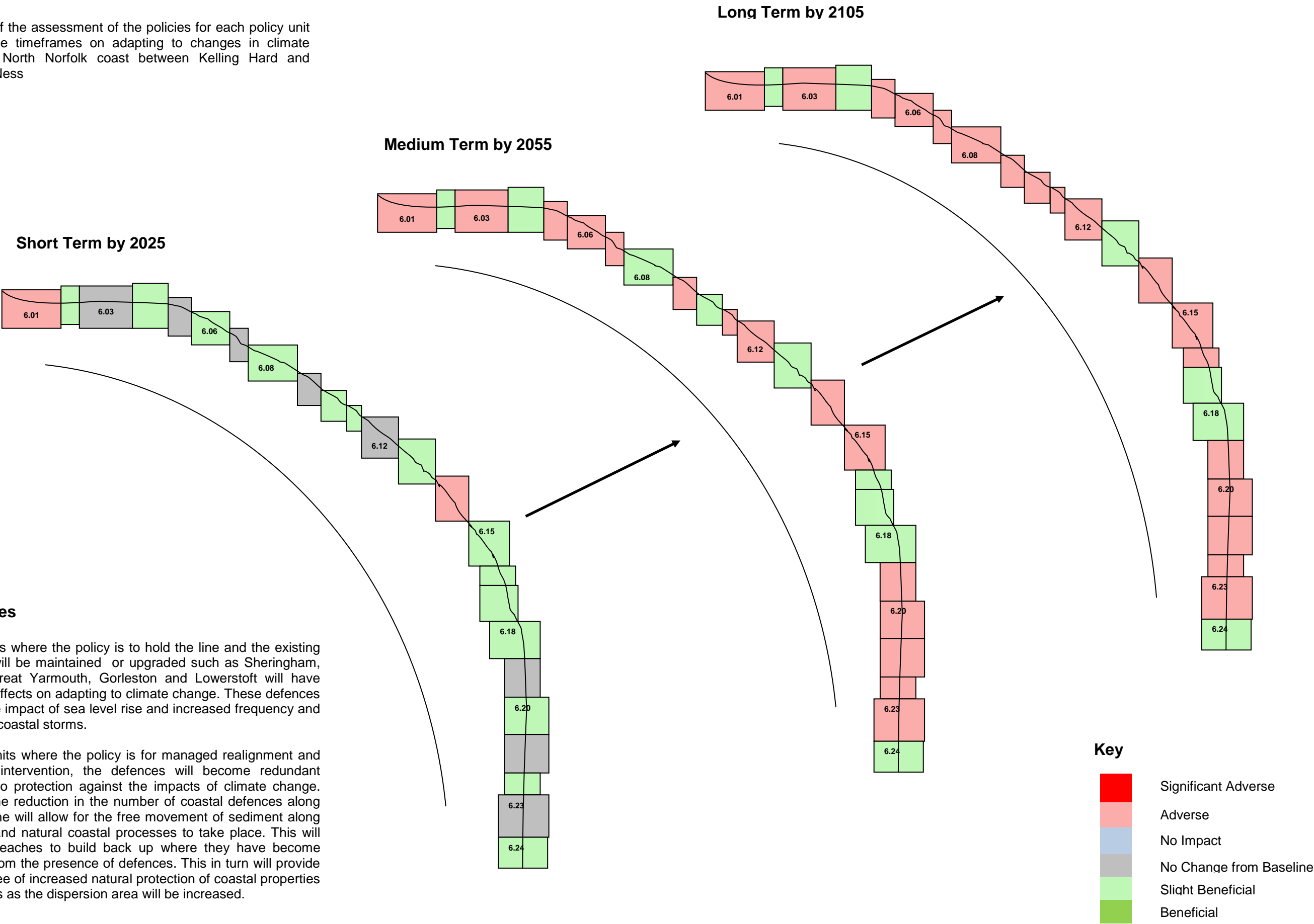
## 9.1.9

*Adapting to changes in climate*

The impact on adapting to changes in climate in the short, medium and long term has been illustrated on Diagram 9. Generally where the policy is to hold the existing line, impacts on adapting to changes in climate will be positive as the maintenance of the defences will provide protection against sea level rise and potential storm surges. However it is likely that where the defences remain they are likely to require significant maintenance especially in the long term in order to maintain their integrity and ensure they are sufficient to defend against the impacts of climate change. The defences will remain in place at the main industrial and commerce centres along the shoreline, such as Sheringham, Cromer, Great Yarmouth, Gorleston and Lowestoft. However the presence of the defences will result in the narrowing and in some instances entire loss of the beach at these locations. This will result in the defences becoming more exposed to wave intensity therefore continually putting strain on them structurally. At the locations in between these towns where the long term policies are to allow the natural functioning of the coastline, the beaches will remain and at some locations replenished once the existing defences have failed. As no active intervention is being carried out at these locations there will be a negative impact on adapting to changes in climate. However, the presence of the beach will provide a natural defence against increased wave intensity.

Diagram 9 Adapting to Changes in Climate

Overview of the assessment of the policies for each policy unit at the three timeframes on adapting to changes in climate along the North Norfolk coast between Kelling Hard and Lowestoft Ness





## 9.1.10

*Historic environment and archaeology*

The impact on the historic environment and archaeology in the short, medium and long term has been presented on Diagram 10. Generally the largest adverse impacts on the historic environment and archaeology are along policy units where the policy is either managed realignment of no active intervention resulting in substantial erosion of the coastline.

*Results of the assessment on the historic environment and archaeology in the Short Term*

In the short term the majority of the defences which are currently present, will remain in place for much of this timeframe. Therefore there will be no impact on the historic environment and archaeology along the majority of the coastline. However, within policy unit 6.01 – Kelling Hard to Sheringham some coastal monuments of high importance and some heritage sites will be lost and within policy unit 6.11 – Bacton, Walcott and Ostend Ostend House which is listed on the SMR register would also be lost. There will also be some loss of Mundesley Holiday Camp within policy unit 6.09 – Mundesley to Bacton Gas Terminal which were the first purpose built holiday camp in the UK.

*Results of the assessment on the historic environment and archaeology in the Medium Term*

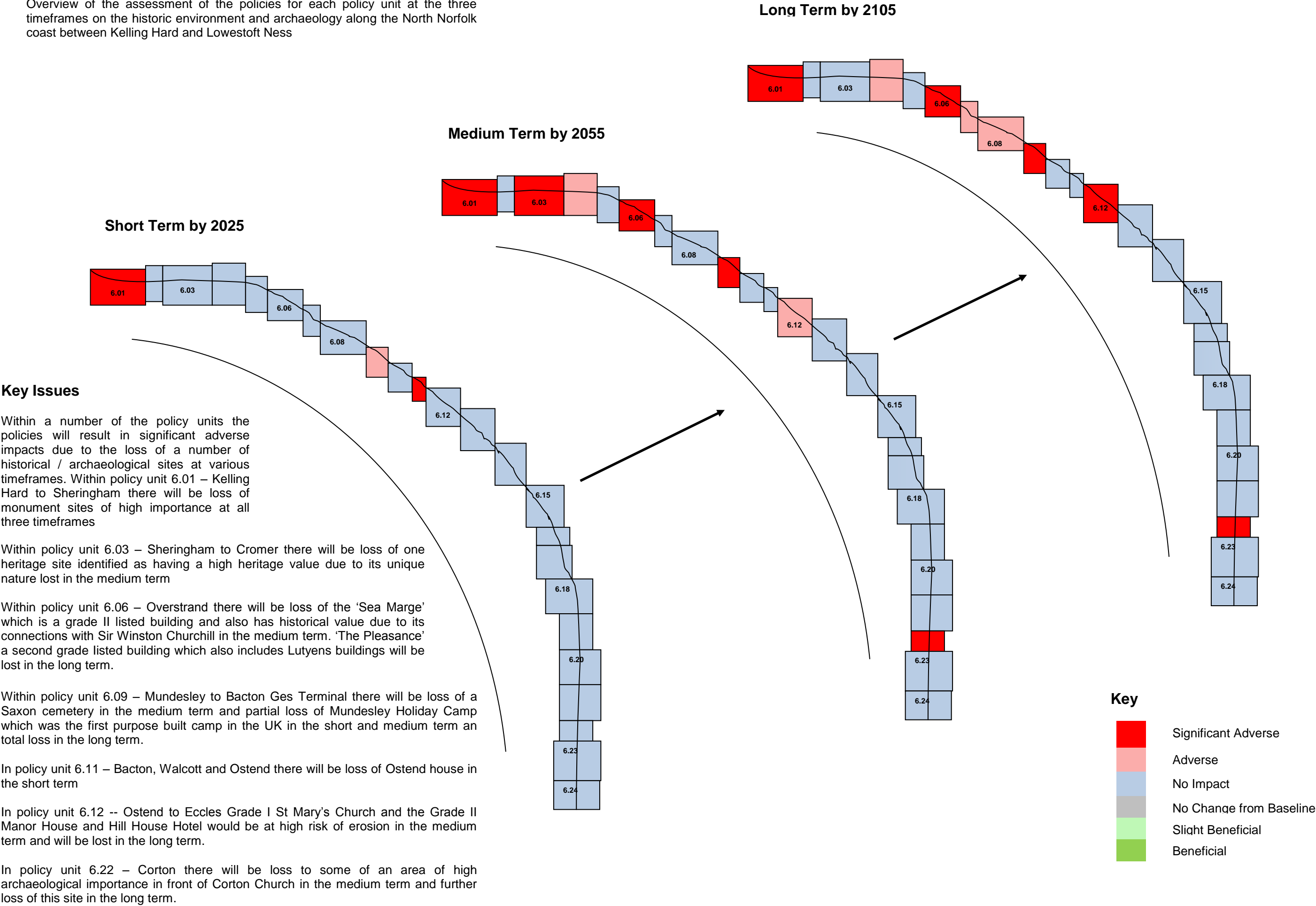
In the medium term there will be larger impacts on the historic environment and archaeology as a large number of the defences along the coastline will have failed. This would result in more widespread erosion and the loss of further sites. Within policy unit 6.01 – Kelling Hard to Sheringham, further sites of high importance would be lost and within policy unit 6.03 – Sheringham to Cromer one heritage site of high importance would also be lost. At Cromer, 6.04, works may be required to the seawall in order to protect its integrity, this could impact on its listed status therefore have a slight adverse impact on the historic environment and archaeology. At Overstrand, policy unit 6.06 and Grade II listed property the 'Sea Marge' would be lost within this timeframe and there would be further loss of Mundesley Holiday Camp within policy unit 6.09 as well as a Saxon Cemetery which has high heritage value. Between Ostend and Eccles which is policy unit 6.12 two listed buildings, Grade I listed St Mary's Church and a Grade II listed Manor House and Hill House Hotel will be at risk of erosion and at Corton, policy unit 6.22 there will be some loss of Corton Church which is of high archaeological importance.

*Results of the assessment on the historic environment and archaeology in the Long Term*

In the long term there would be further losses to the heritage sites within policy unit 6.01 – Kelling Hard to Sheringham and further works would be required on the seawall at Cromer. Within policy unit 6.06 – Overstrand a further Grade II listed building 'The Pleasance' would be lost. Within policy unit 6.07 – Overstrand to Mundesley Trimmingham Church will be lost and at the neighbouring policy unit Mundesley there will also be loss of some heritage sites. To the south of Mundesley within policy unit 6.09 the holiday camps would be lost and between Ostend and Eccles, policy unit 6.12 the Grade I and Grade II listed buildings which were at risk in the medium term would be lost at this timeframe. There would also be further loss of Corton Church and heritage sites at Corton to the south of the SMP area.

Diagram 10 Historic Environment and Archaeology

Overview of the assessment of the policies for each policy unit at the three timeframes on the historic environment and archaeology along the North Norfolk coast between Kelling Hard and Lowestoft Ness



## 9.1.11

*Natural landscape and seascape*

The impact on the natural landscape and seascape in the short, medium and long term has been presented on Diagram .11 Generally within policy units where the long term policy is for managed realignment or no active intervention there will be a positive impact on the natural landscape as any existing defences will be allowed to fail and a naturally functioning coastline will be able to form.

*Results of the assessment on the natural landscape and seascape in the Short Term*

In the short term there would be little impact on the natural landscape as the majority of defences will still remain in place during this timeframe. There will be positive impacts on policy units 6.01 – Kelling Hard to Sheringham, 6.05 – Cromer to Overstrand, 6.07 – Overstrand to Mundesley and 6.09 – Mundesley to Bacton Gas Terminal as at these locations the policy will result in the exposure of the SSSIs being maintained which will have a positive impact on this quality of the AONB. A negative impact has been identified at policy unit 6.10 – Bacton Gas Terminal as the presence of the defences will result in poor exposure of the cliffs at this location impacting on this quality of the AONB. On the other hand where properties, farmland and historical sites are lost this will also have a negative impact on the AONB as the loss of these assets could impact on the quality on character of the AONB.

*Results of the assessment on the natural landscape and seascape in the Medium Term*

In the medium term where the policy is for managed realignment or no active intervention the existing defences will fail or will be failing. Where defences are left to fail under a no active intervention scenario, this could have a negative impact on the natural landscape. However, would result in a more pronounced positive impact on the natural landscape as the for a large proportion of the coastline it will be able to function more naturally. There would be negative impacts on the natural landscape where the policy is to hold the existing line, as at these locations the beaches will become narrower and the coastline would be prevented from functioning naturally. There will continue to be mixed impacts on the AONB.

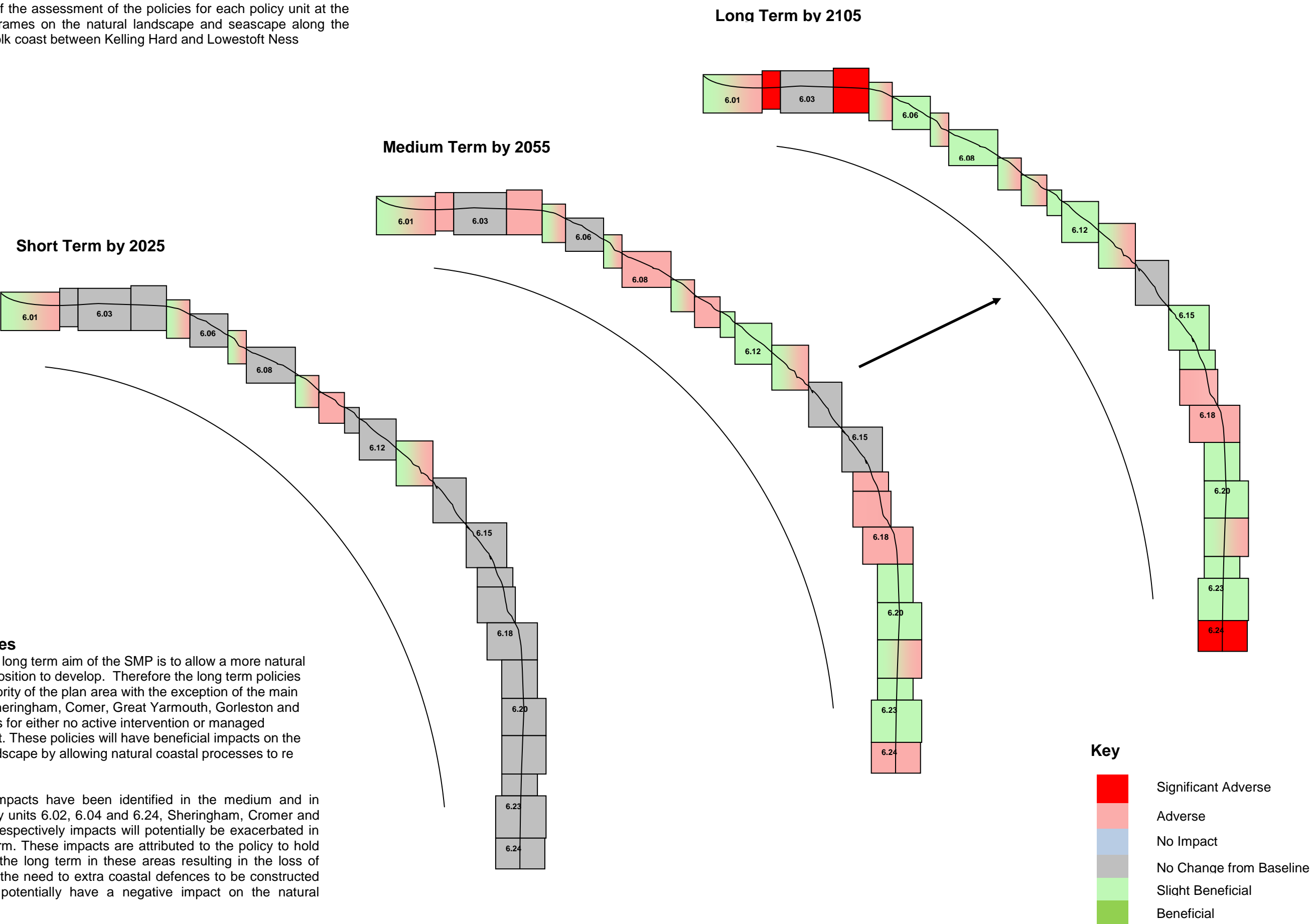
*Results of the assessment on the natural landscape and seascape in the Long Term*

In the long term the impacts on the natural landscape would be more pronounced both positive and negative. Around the main industrial and commercial centres at Sheringham, Cromer, Great Yarmouth, Gorleston and Lowestoft the continued protection of the assets at these locations would result in narrowing or complete loss of the beaches. This would increase the exposure of the coastal defences to increased wave exposure, therefore by this timeframe they are likely require substantial maintenance or upgrading to ensure their integrity. This and the lack of beach would both have detrimental impacts on the environment. However along the majority of the coastline between these centres the long term plan in to allow retreat for a naturally functioning coastline to develop which would have beneficial impacts on the natural landscape.

During the long term there will continue to be mixed impact on the AONB, positive associated with the loss of defences allowing the exposure of the designated sites to be maintained, but also the loss of property, farmland and historical sites resulting in a negative impact on the character of this quality. It should however be considered the overall aim of the policy units where impacts on the AONB have been predicted is to allow and more naturally functioning coastline to develop. Though thought should also be given to the overall coastline along the AONB area, as if defences are maintained in certain locations (the main towns) these areas may increasingly form promontories which may result in the development of bays either side changing the relationship between the land and the sea along the AONB frontage.

Diagram 11 Natural landscape and seascape

Overview of the assessment of the policies for each policy unit at the three timeframes on the natural landscape and seascape along the North Norfolk coast between Kelling Hard and Lowestoft Ness



## 9.1.12

*Built landscape and townscape*

The impact on the built landscape and townscape in the short, medium and long term, has been presented on Diagram 12. Generally the impacts on the built landscape and townscape are a reverse of those on the natural landscape. Where the policies are for managed realignment or no active intervention and there would be associated property loss the impacts on the built landscape will be negative.

*Results of the assessment on the built landscape and townscape in the Short Term*

In the short term the majority of the negative effects on the built landscape will be around the centre of the SMP area where the failure of the defences and no active intervention would result in loss of property and facilities.

*Results of the assessment on the built landscape and townscape in the Medium Term*

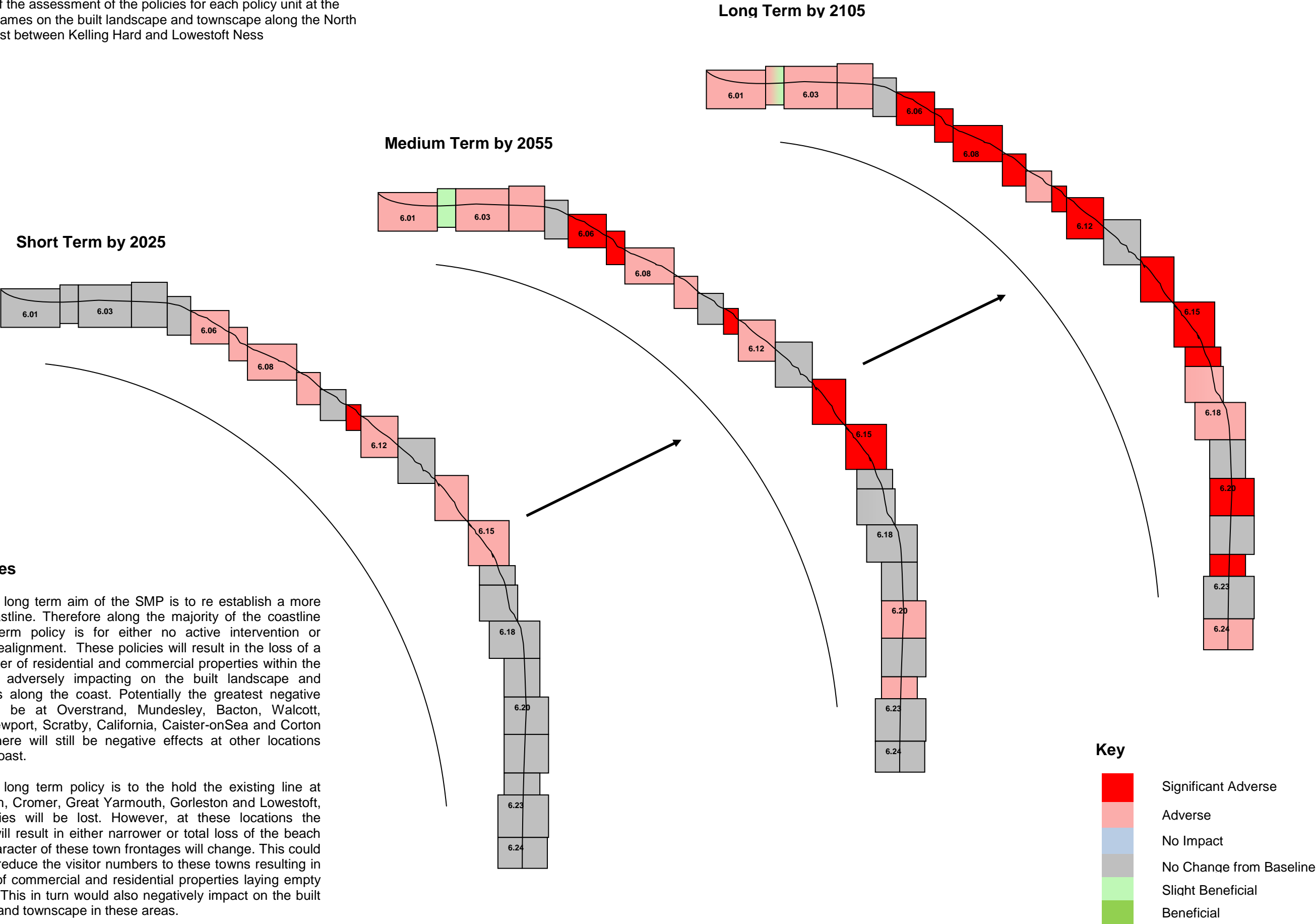
In the medium term, the impacts on the built landscape and townscape will become more pronounced within policy units where it is expected that there will be substantial property loss. These areas are policy units 6.06 and 6.07 Overstrand and Overstrand to Mundesley respectively and policy units 6.14 and 6.15 Winterton to Scratby and California to Caister-on-Sea.

*Results of the assessment on the built landscape and townscape in the Long Term*

In the long term, there is expected to be further property loss within those units that have a managed realignment or no active intervention policy. This will have more pronounced impacts on the built landscape and townscape, both directly through the loss of property and indirectly through other properties potentially becoming empty or abandoned in the surrounding area. Negative impacts have also been identified at units where the policy is to hold the line such as Cromer and Great Yarmouth. The maintenance of the defences at both of these units will result in there being little or no beach by this timeframe. This could potentially reduce the number of visitors to the area which would have an impact on tourism and recreation in the area. This in turn could result in a number of tourist facilities / properties becoming disused which could lead to sections of the town laying empty and run down having a negative impact on the built landscape and townscape.

Diagram 12 Built Landscape and Townscape

Overview of the assessment of the policies for each policy unit at the three timeframes on the built landscape and townscape along the North Norfolk coast between Kelling Hard and Lowestoft Ness



Key Issues

Overall the long term aim of the SMP is to re establish a more natural coastline. Therefore along the majority of the coastline the long term policy is for either no active intervention or managed realignment. These policies will result in the loss of a large number of residential and commercial properties within the SMP area adversely impacting on the built landscape and townscapes along the coast. Potentially the greatest negative impact will be at Overstrand, Mundesley, Bacton, Walcott, Ostend, Newport, Scratby, California, Caister-onSea and Corton although there will still be negative effects at other locations along the coast.

Where the long term policy is to the hold the existing line at Sheringham, Cromer, Great Yarmouth, Gorleston and Lowestoft, no properties will be lost. However, at these locations the defences will result in either narrower or total loss of the beach and the character of these town frontages will change. This could potentially reduce the visitor numbers to these towns resulting in a number of commercial and residential properties laying empty or derelict. This in turn would also negatively impact on the built landscape and townscape in these areas.

## 9.1.13

*Coastal material assets*

The impact on coastal material assets in the short, medium and long term, has been presented on Diagram 13. In general there will be negative impacts on material assets where the policy is for managed realignment or on active intervention. Where properties and infrastructure are protected there will be a positive impact on coastal material assets.

*Results of the assessment on coastal material assets in the Short Term*

In the short term there will be negative impacts on those policy units where no active intervention will result in the loss of property and or land. A significant adverse impact has been identified on Policy unit 6.11 – Bacton, Wallcott and Ostend where a significant amount of property would be lost within this timeframe.

*Results of the assessment on coastal material assets in the Medium Term*

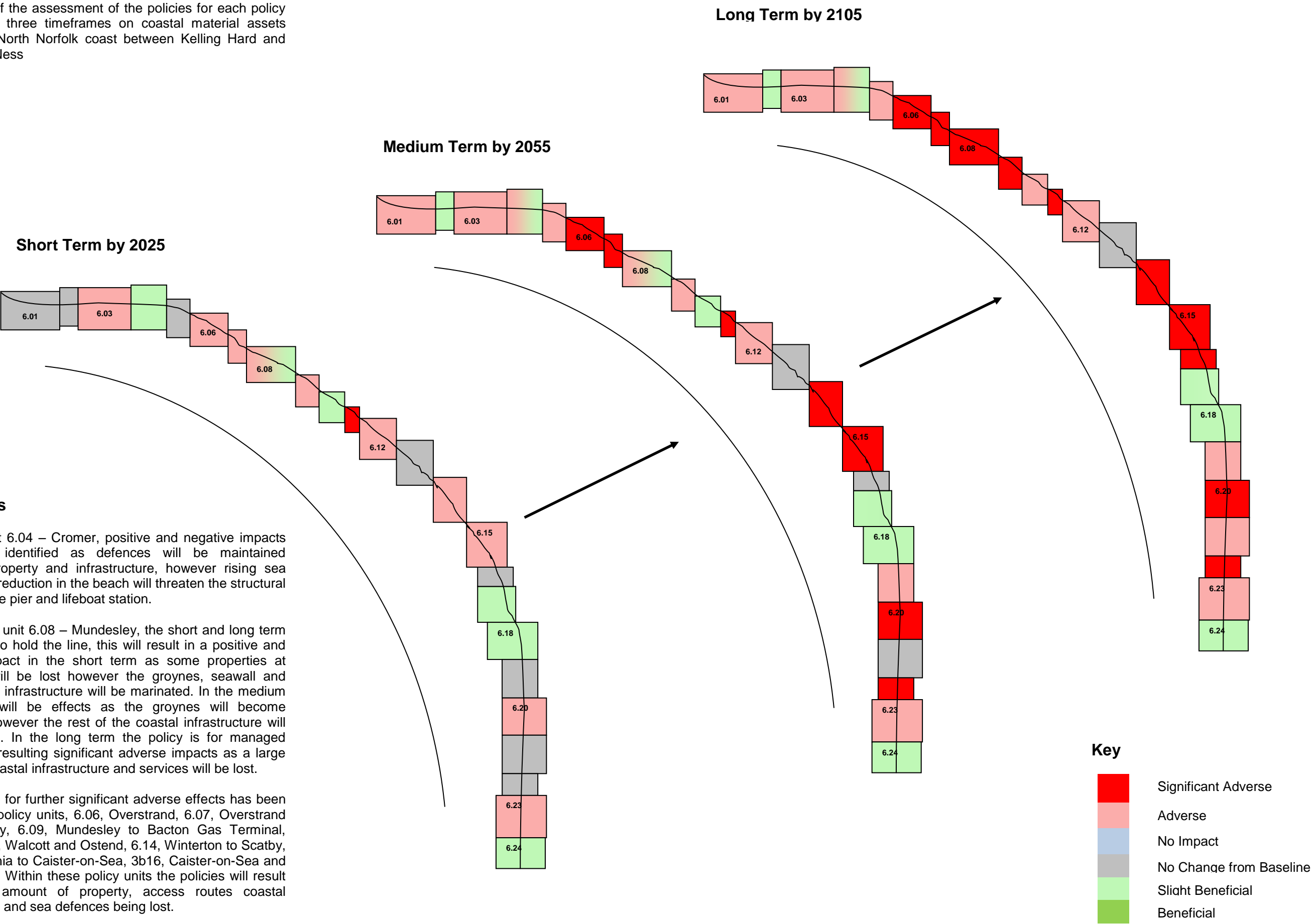
In the medium term the impacts on coastal material assets will be more pronounced as the shoreline retreats. The majority of the defences which are currently protecting these assets within policy units where the policy is for managed realignment or no active intervention will have failed or being failing during this timeframe, exposing these units to increased erosion.

*Results of the assessment on coastal material assets in the Long Term*

In the long term there will be further loss to the property, infrastructure and access roads within the policy units where the long term policy is to allow retreat. At the main commercial centres where the policy is to hold the line, the material assets will be protected having a positive impact. There could however, also be potential for a negative impact at these locations as the lack of beach and increased wave intensity could result in increased risk of overtopping of roads and properties along promenades. In addition where the loss of properties and other infrastructure leading to blight in the surrounding area the dereliction of properties will also have a negative impact on coastal material assets.

Diagram 13 Coastal Material Assets

Overview of the assessment of the policies for each policy unit at the three timeframes on coastal material assets along the North Norfolk coast between Kelling Hard and Lowestoft Ness





## 9.1.14

*Coastal activities and industries*

The impact on coastal activities and industries in the short, medium and long term, has been presented on Diagram 14. In general where the long term policies are for retreat to allow a naturally functioning coastline there will be negative impacts on coastal activities and industries. Where assets are protected generally there will be a positive impact on coastal activities and industries

*Results of the assessment on coastal activities and industries in the Short Term*

In the short term there will be negative impacts on activities and industries within those policy areas where the policy is for managed realignment or no active intervention as there would be loss of property and land. These impacts will be more pronounced where the existing defences would fail during this timeframe.

*Results of the assessment on coastal activities and industries in the Medium Term*

In the medium term there will be more pronounced negative impacts at policy unit 6.07 – Overstrand to Mundesley as further properties will be lost as well as the caravan park which will adversely impact the tourism and recreation sector. There will also be more pronounced negative impacts on policy units 6.11 and 6.12, Bacton, Walcott and Ostend and Ostend to Eccles due to the impact on the tourism and recreation sector due to losses of the caravan park and impacts on the agricultural sector associated with the loss of farmland. Between policy units 6.20 and 6.22 Hopton to Corton there will also be substantial impacts on the tourism sector due to the loss of both accommodation and facilities.

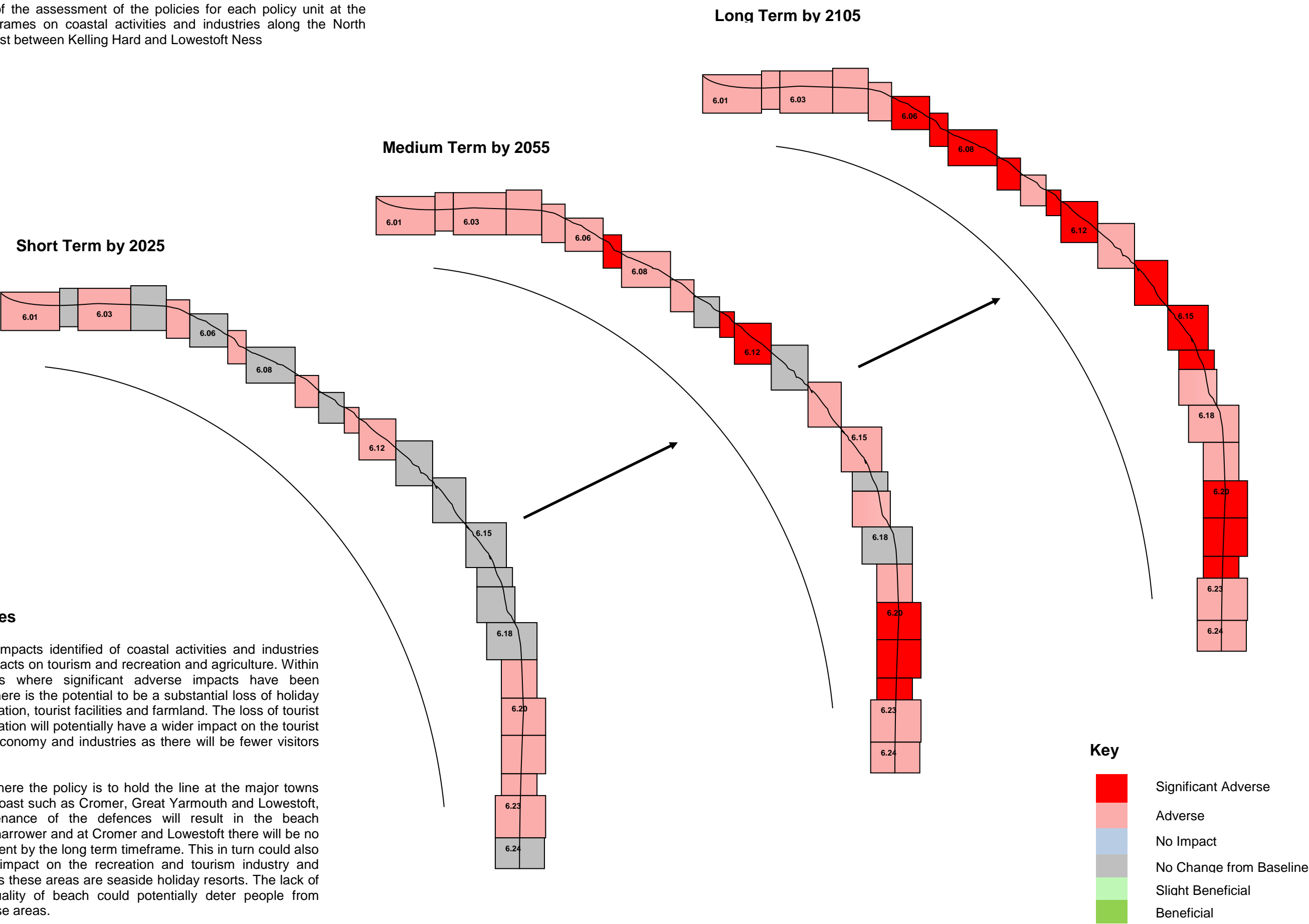
*Results of the assessment on coastal activities and industries in the Long Term*

In the long term the negative impacts will be more pronounced where the policies are for managed realignment and no active intervention. There could also potentially be negative impacts on those policy units where the policy is to hold the existing line such as at Cromer and Great Yarmouth. At these locations the presence of the defences will result in there being little or no beach by this timeframe. This could detract visitors from these seaside resorts resulting in a negative impact on the tourist trade. Where defences are allowed to fail and beaches become wider and more accessible there could be positive impacts on coastal activities and industries on users of the beach, however in general these impacts are counteracted by the loss of houses and infrastructure relating to other activities within these policy units.

=

Diagram 14 Coastal Activities and Industries

Overview of the assessment of the policies for each policy unit at the three timeframes on coastal activities and industries along the North Norfolk coast between Kelling Hard and Lowestoft Ness



## 9.1.15

*Physical and mental wellbeing*

The impact on physical and mental wellbeing in the short, medium and long term, has been presented on Diagram 15. The general impact on physical and mental wellbeing will be negative where the policies are for managed realignment or no active intervention as these will result in the loss of property and land. Where the policy is to hold the existing line the impact on physical and mental wellbeing are generally positive.

*Results of the assessment on physical and mental wellbeing in the Short Term*

In the short term, there will be negative impacts on physical and mental wellbeing along those policy units where the policies are for no active intervention and managed realignment will result in the loss of property and or land. This could result in stress and anxiety for property or business owners. There will be positive impacts on this topic area where the maintenance of the defences prevent this loss.

*Results of the assessment on physical and mental wellbeing in the Medium Term*

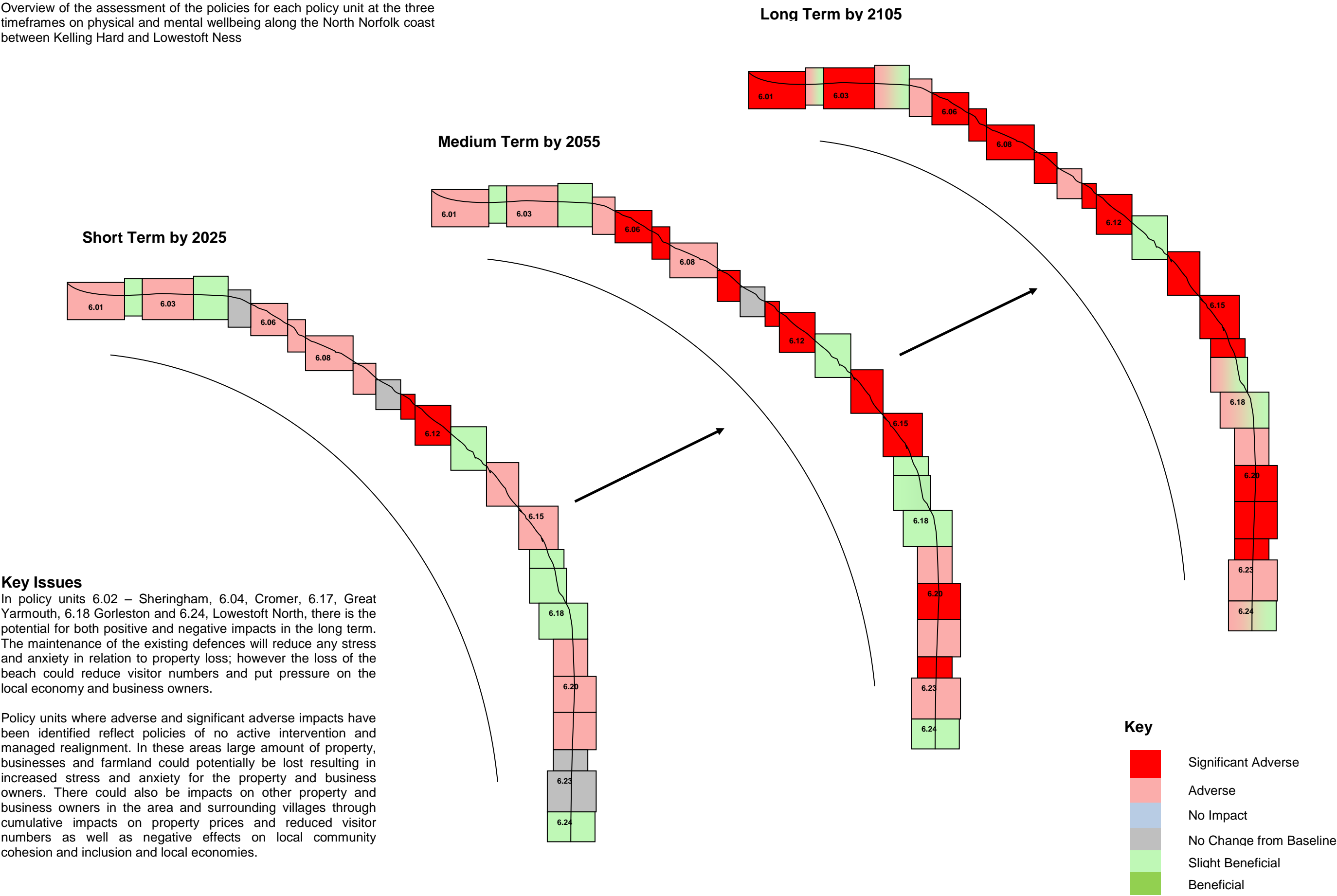
In the medium term negative impacts on this topic will become more pronounced within those policy units where substantial property loss is protected due to the failure of the defences within this timeframe.

*Results of the assessment on physical and mental wellbeing in the Long Term*

In the long term the adverse impacts would become more pronounced as the majority of the coastline is allowed to retreat resulting in a large loss of property and land. There will be positive impacts within the main industrial and commerce sectors where property will be maintained by the defences, reducing any stress and anxiety caused by the fear of property loss. However there is potential for negative impacts at these locations as well. If the tourist trade is affected by the lack of beach, this could result in an adverse impact on those people that rely upon the tourist economy within the region.

Diagram 15 Physical and Mental Wellbeing

Overview of the assessment of the policies for each policy unit at the three timeframes on physical and mental wellbeing along the North Norfolk coast between Kelling Hard and Lowestoft Ness



# 10 Mitigation

## 10.1 Introduction

This section sets out mitigation measures for the adverse impacts that have been identified by the assessment.

It should be noted that this assessment is strategic and very high level therefore until more detailed strategies which are set out in the SMP Action Plan are carried out to test the viability of the implementation for each policy option site specific mitigation cannot be identified.

### 10.1.1 *Protected sites and species*

There are a number of protected sites and species along the shoreline area including SACs, SPAs, Ramsars SSSIs and CWS. The majority of them will benefit from the shoreline management policies as where they fall in no active intervention or managed realignment policy areas and the continued erosion will maintain their designation. At a number of sites the policy to hold the existing line will result in poor exposure of the SSSI sites.

Within policy unit 6.02 – Sheringham, Beeston Cliffs SSSI will be adversely affected. However part of this site also falls within policy unit 6.03 – Sheringham to Cromer where the policy is for no active intervention. This would allow for continued erosion of this section of the SSSI maintaining the integrity of this section. In time this could allow for the development of two units of this SSSI site and the potential for establishment of new habitats and species within the section where erosion has been prevented by the coastal defences. This site should be monitored and any changes in exposure and associated habitats documented.

Within policy unit 6.10 – Bacton Gas Terminal the policy for the short and medium term timeframes is to hold the existing line with managed realignment in the long term. The policy in the short and medium term will result in poor exposure of Mundesley Cliffs SSSI. As with Beeston Cliffs SSSI, this site also falls within a second policy unit in this case 6.09 – Mundesley. Within this unit the policy for all three timeframes is no active intervention resulting in the integrity of the section of the SSSI which falls within this unit to be maintained. This may result in the SSSI forming two units during the short and medium term, however reverting the policy to managed realignment within 6.10 in the long term will result in the re exposure of this section of the cliffs reversing any adverse impact. This site should be monitored and any changes in exposure and associated habitats documented.

Within policy unit 6.13 – Eccles to Winterton Beach Road, there is the potential for an adverse impact on Winterton – Horsey Dunes SAC / SSSI by the long term associated with the exposure of the sea wall preventing the movement of sediment from the beach to the upper shore. It is thought that providing the wall remains largely buried by sand this impact is mitigated. Therefore artificial recharge of the beach should continue to be implemented to ensure the wall remains buried and the integrity of the protected sites maintained until detailed studies and monitoring have been undertaken. The hold the line policy within this unit is conditional on it remaining technically, economically and environmentally sustainable. If this is not the case the managed realignment policy will be implemented which will result in saline intrusion into the Broads SAC, SPA and Broadland Ramsar. Managed realignment should not be implemented until further detailed strategies, studies, and monitoring has been undertaken to mitigate this impact.

Within policy unit 6.17 – Great Yarmouth it is expected that the integrity of the North Denes SSSI will be maintained over the three timeframes though there is the potential for some losses

to the SPA area. The impact on the SPA and appropriate mitigation has been presented within the HRA

The HRA presents appropriate mitigation measures for all the Natura 2000 sites along the coastline which have the potential to be impacted by the implementation of the SMP policies.

Where policy options may prohibit the exposure of sections of SSSIs in the short and medium term whilst social mitigation is developed and implemented, consideration should be given to dig out these cliff faces to maintain the exposure in the interim. In addition dig out should be considered in the long term for a section of Beeston Cliffs SSSI which falls within policy unit 6.02 (Sheringham) as the long term policy is to hold the existing line.

### 10.1.2

#### *Ecosystems and biological diversity*

The continued erosion of the shoreline will inevitably impact on the ecosystems, habitats and biological diversity that inhabit the shoreline. Where the policies are for no active intervention or managed realignment any existing defences will be allowed to deteriorate and fail and a naturally functioning shoreline will eventually establish along these areas. Therefore any loss of biodiversity in these areas will be due to the natural processes and mitigation would not need to be implemented. However records should be kept documenting the continual changes to ecosystems, and biological diversity along the shoreline.

Whilst the hold the line policy remains in place within policy units 6.08, 6.15 and 6.16 during the short and medium terms there will be no impact on ecosystems and biodiversity including CWSs. However the long term policy in all three of these units is to allow retreat, resulting in some loss of CWS. Whilst the line will continue to be held in the short and medium term, further studies should be carried out to investigate options for the relocation of these sites further inland. Records should be kept documenting any loss or partial loss of any CWS.

### 10.1.3

#### *Sediment, geology, and geomorphology (coastal processes)*

The long term plan for the majority of the SMP area is to allow retreat with the exception of the major industrial and commercial centres along the coast which are Sheringham, Cromer, Great Yarmouth, Gorleston and Lowestoft. Therefore in the long term the majority of the shoreline will be able to function naturally having a positive impact on substrate.

For many of the units where managed realignment or no active intervention policies will result in the loss of property the line will continue to be held either for the whole policy unit or sections within these units. This will allow more detailed strategies to be carried out in order to develop appropriate social and economic mitigation measures and confirmation of the policy option. Continuing to hold the line will have impacts on substrate, both within these areas and the subsequent units along the coast that rely upon a supply of sediment from these areas in order to maintain their natural defences.

Continuing to hold the line will also result in cut back at either end of the sea defences which will result in these areas temporarily forming promontories until the policies are reverted to either managed realignment or no active intervention. These impacts will be temporary as the long term aim is for retreat. However it should be recognised that whilst detailed strategies are required to develop appropriate social and economic mitigation are of the upmost importance the timescales over which they are carried out should be considered, to prevent permanent morphological changes to stretches of the coastline.

Coastal process should be monitored throughout both of these timeframes and temporary mitigation measures should be implemented where necessary such as importing of beach material.

Along the stretches of the coastline in front of the main commercial centres the policy option is for the assets to be protected and line to be held into the long term. This will result in the narrowing of beaches and along these stretches and in areas the beach will completely disappear by the long term. However due to the nature of these units being highly developed

urban environments managed realignment and no active interventions policies which would maintain the integrity of the beach in these locations would result in much wider environmental, social and economic implications. The more detailed strategies should however identify the viability of importation of beach material.

#### 10.1.4 *Water Quality*

Adverse impacts on water quality will occur where the policies are for no active intervention or managed realignment. Where these policies are implemented property and infrastructure and the associated services would be lost which, if this is not controlled appropriately, there will be adverse impact on coastal water quality. All services and sewers should be decommissioned and where possible removed prior to erosion taking place. The more detailed strategies should identify appropriate managed procedures for this to take place.

Within policy unit 6.06 – Overstrand implementing the policy option will result in the loss of a pumping station in the medium term and loss of pumping station within policy unit 6.21 – Hopton to Corton in the long term. In addition, within policy unit 6.23 – Corton to Lowestoft an old oil dump will be exposed. The pumping stations will need to be decommissioned and removed before being allowed to erode. The old oil dump would need to be remediated before this section of the shoreline is allowed to erode; detailed surveys are required to establish how this will be achieved.

#### 10.1.5 *Coastal flooding*

Where the policy is for no active intervention or managed realignment the beaches will remain or in some cases widen as a result of continual sediment supply to these locations. The maintenance of these beaches will allow for them to act as a natural sea defence.

Where the policy option is to hold the existing line the beaches will narrow exposing these sections of the shoreline to heightened wave intensity. At these locations strategies should be put in place to ensure the integrity of the sea defences are maintained.

#### 10.1.6 *Dust*

Where construction is required in order to maintain the integrity of the coastal defences it should be completed, where possible, outside the tourist season (June-September) to minimise the disruption to visitors and local people.

#### 10.1.7 *Noise*

Where construction is required in order to maintain the integrity of the coastal defences it should be completed, where possible, outside of the tourist seasons (June to September ) to minimise the disruption to visitors and local people.

#### 10.1.8 *Reducing CO2 Emissions*

No adverse impacts have been identified.

#### 10.1.9 *Adapting to Changes in Climate*

Where the policy options are for no active intervention or managed realignment the sea defences will be allowed to deteriorate and fail. At these locations there will be no protection against predicted sea level rise which could result in coastal flooding.

Where the defences will be maintained the coast which lies behind the defences will be protected. However the integrity of the defences will be continually challenged. Mitigation measures such as continued maintenance or potential re-building of the defences will need to be implemented at these locations. Construction of additional defences may be required if the protection of these areas results in them forming promontories. If promontories were allowed to develop, these areas could become vulnerable from coastal flooding at either end of the defences where cut back has occurred. The more detailed strategies should model the potential implications of this and develop appropriate solutions.

#### 10.1.10 *Archaeology and Heritage*

There are numerous archaeological and heritage assets along the shoreline, some of which will be lost if no active intervention or managed realignment policies are implemented. Historic Environment Records are kept by all local authorities, which include designated and undesignated sites. These however do not include an assessment of significance. Surveys should be undertaken of each of the archaeological and historic sites which are predicted to be lost within each timeframe. These should assess the significance of each of the sites and set out a plan for each of them depending on their importance. All sites should be recorded and documented and where they are deemed to be of high significance archaeological sites should be excavated and recorded. For buildings of heritage value consideration should be given to either controlled dismantling or relocation.

#### 10.1.11 *Natural Landscape and Seascape*

Overall the SMP will have a beneficial impact on the natural landscape and seascape as the long term policy option for the majority of the SMP area is managed or un-managed retreat, which will allow the formation of a naturally functioning coastline. This will not be the case where the hold the line policies will be continued through to the long term. At these locations the beaches will narrow and steepen and in some places will have disappeared by the long term. This will result in adverse impacts at these locations. The more detailed strategies should consider the viability of measures such as importation of sediment. Where the long term policy options are to maintain the line, the natural landscape have already permanently be transformed into urban townscapes, therefore the maintenance of the defences in these locations will not have any further detrimental impacts on the natural landscape and seascape.

The detailed strategies should consider impacts on the AONB. Whilst policy EN12 in the North Norfolk Local Development Framework Core Strategy September 2008 allows the replacement of development affected by coastal erosion risk within the AONB, options for roll back of the AONB itself should also be considered to mitigate against the physical loss along eroding sections of the coast. Whilst it should be recognised that the where character within the AONB may be lost at coastal sites the overall aim of the policies in these locations is to allow a naturally functioning coastline. However detailed strategies should consider and monitor long term impacts along the AONB coast if intermediate policy units such as Sheringham and Cromer continue to form promontories if the line is held.

#### 10.1.12 *Built Landscape and Townscape*

Where the policies are for no active intervention or managed realignment this will result in the loss of property and infrastructure along the SMP area, thus having a negative impact on the built landscape and townscape. Where this is the case, changes should be documented and photographic records kept.



The main commercial centres along the coast, Sheringham, Cromer, Great Yarmouth, Gorleston and Lowestoft will retain their integrity as the sea defences at these locations will be maintained. Whilst property at these locations will be protected, mitigation measures should be put in place such as further investment into the tourist economy to ensure that these towns do not become neglected as a result of the loss of the beach and the implications of the other policy options.

#### 10.1.13 *Coastal Material Assets*

The long term aim of the SMP is for the majority of the shoreline to be allowed retreat. This would result in a large loss of material assets along the coastline such as commercial and residential infrastructure and services associated with these.

The SMP will be subject to further more detailed strategies which are set out within the Action Plan in the SMP. These will confirm the deliverability of the policy options in each of the units. Where the aims are found to be deliverable these will be subject to further more detailed project appraisal and monitoring and specific mitigation measures would be developed. Where the aims are found not to be deliverable the existing policy from SMP 1 will be carried over until the next SMP review where the policy options will be reviewed and revised where necessary. However the relevant planning authorities will work off the assumption that the SMP 2 policies will be implemented, even if they are found not to be deliverable after the detailed strategies have been carried out. This process should allow for a gradual transition of the material assets which can be more easily mitigated during the next review of the SMP.

#### 10.1.14 *Coastal Activities and Industries*

The retreat of the coastline will result in the loss of a number of industries and other activities that are undertaken along the coast such as the recreation and tourism industry and any associated businesses.

The SMP will be subject to further more detailed strategies set out within the SMP Action Plan. These will confirm the deliverability of the policy options in each of the units. Where the aims are found to be deliverable these will be subject to further more detailed project appraisal and monitoring and specific mitigation measures would be developed. Where the aims are found not to be deliverable the existing policy from SMP 1 will be carried over until the next SMP review where the policy options will be reviewed and revised where necessary. However the relevant planning authorities will work off the assumption that the SMP 2 policies will be implemented, even if they are found not to be deliverable after the detailed strategies have been carried out. This process should allow for a gradual transition of the activities and industries along the coastline which can be more easily mitigated during the next review of the SMP.

#### 10.1.15 *Physical and Mental Wellbeing*

The retreat of the coastline will result in the loss of a large number of properties, industries and land, which will have adverse impacts on physical and mental wellbeing of the owners of these or people who rely upon these industries for an income.

The SMP will be subject to further more detailed strategies set out within the SMP Action Plan. These will confirm the deliverability of the policy options in each of the units. Where the aims are found to be deliverable these will be subject further to more detailed project appraisal and monitoring and appropriate mitigation economic and social measures would be developed. Where the aims are found not to be deliverable the existing policy from SMP 1 will be carried over until the next SMP review where the policy options will be reviewed and revised where necessary. However the relevant planning authorities will work off the assumption that the SMP 2 policies will be implemented, even if they are found not to be deliverable after the detailed strategies have been carried out. This process should allow for a gradual transition of the type

of residency and industries along the coastline which can be more easily mitigated during the next review of the SMP.

# 11 Monitoring

## 11.1 Introduction

The purpose of this chapter is to set out the measures to be undertaken to monitor the significant environmental effects of the implementation of the plan or programme.

Monitoring must be seen in the context of the Plan which is being proposed and logically, monitoring must be linked to the various stages of implementation of the plan.

## 11.2 Purpose of Monitoring

Monitoring is an ongoing process which is undertaken throughout the lifetime of the plan. The information gathered through monitoring will assist the relevant local authorities in identifying and mitigating the environmental effects of implementing the adopted plan. If adverse effects are identified, these can be addressed by altering the way in which the plan is implemented.

The uncertainties associated with high level, strategic assessment make monitoring all the more important. Monitoring allows for periodic checks to confirm the accuracy of the assumptions on which the original assessment was based and to ensure that the proposed mitigation measures remain relevant and are being effectively implemented. Monitoring is therefore closely linked to the proposed mitigation measures set out in Chapter 10.

Monitoring should measure the following:

- A change in environmental baseline that will indicate the effects of the plan;
- The significant effects that have been identified during this assessment;
- Whether the mitigation measures proposed to offset or reduce the significant effects have been implemented and are effective; and
- Any unforeseen impacts that have occurred

## 11.3 Monitoring the SEA of the SMP

Due to the high level nature of the SMP and the uncertainty that surrounds the implementation of the policy options until further strategies have been carried out it has not been possible to present a detailed monitoring strategy. Monitoring should instead be tightly linked to the five to ten yearly reviews of the SMP.

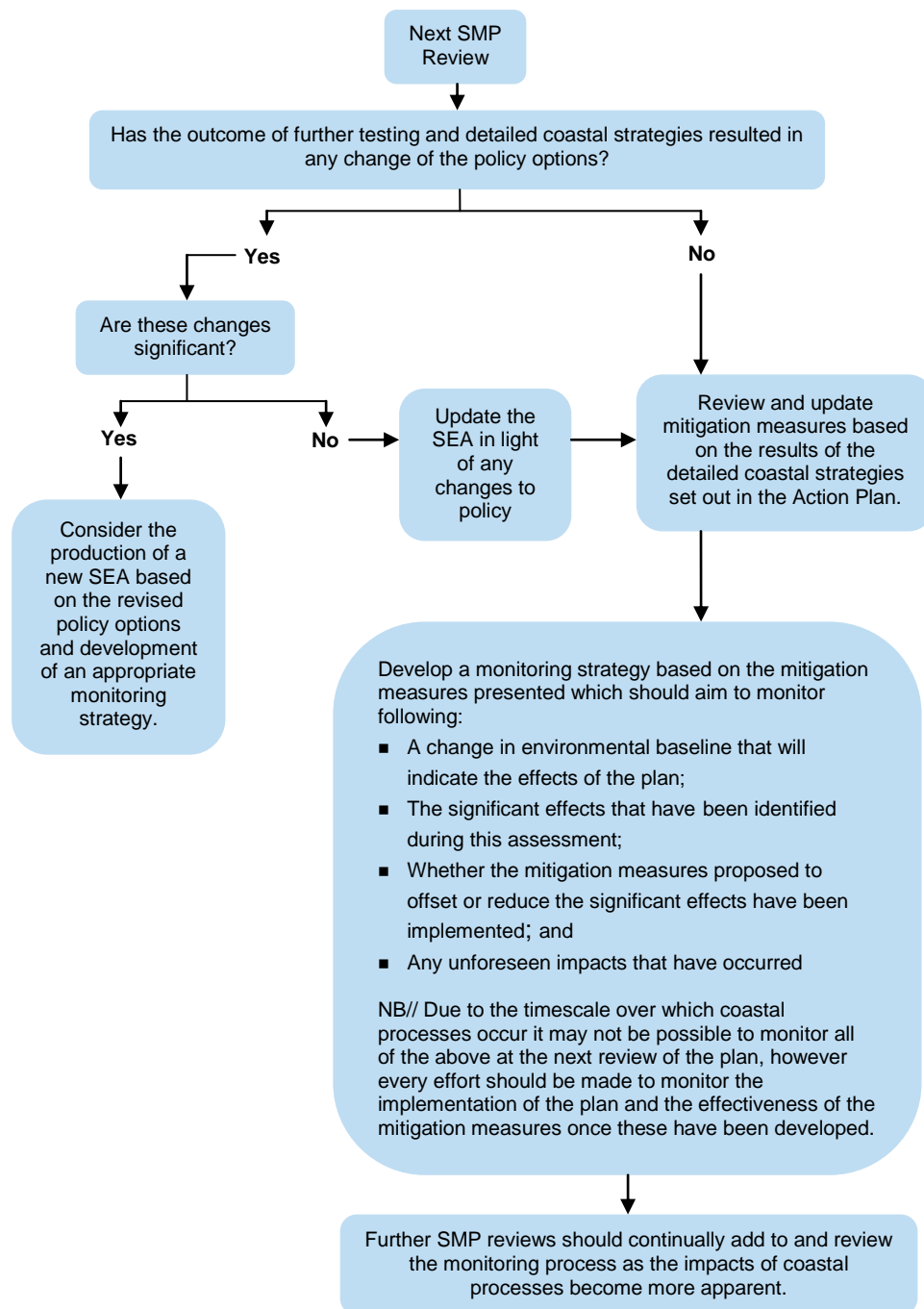
The coastal processes will be monitored as part of the SMP, however, due to the nature of the plan and the timeframes involved it is unlikely that any of the significant effects predicted by this assessment would have occurred by the next review. Where temporary localised native impacts have been identified such as increased noise levels associated with the construction of defences these will be monitored at a project level at the time of construction. Table 11.1 sets out a high level monitoring strategy which should be used as guidance until the uncertainties which surround the policy options based on the outcomes of future strategies are determined.

**Table 11.1: Monitoring the effects of the SMP**

SEA Topic	Proposed Measures
Protected sites and species	Protected sites and species are monitored with regards to their conservation objectives. Any increase in unfavourable / favourable conditions will be monitored in conjunction with the implementation of the policy options as well as any habitat loss / increase.
Ecosystems and biological diversity	
Sediment, geology, geomorphology (coastal processes)	Coastal processes will be monitored as part of the SMP this will monitor current processes and any changes to these as a result of the implementation of any of the policy options.
Water quality	Coastal water quality is monitored by the Environment Agency under the requirements of the Water Framework Directive (WFD). Where policy options will result in the loss of services associated with infrastructure such as sewers or pumping stations or the exposure of any landfill sites / oil dumps further more regular monitoring should be undertaken to ensure these are not impacting on coastal water quality.
Coastal flooding	Flood maps should be updated to represent any changes in the defence along the coastline.
Dust	Impacts on increased dust and noise levels and increased CO <sub>2</sub> emissions associated with the construction of defences will be temporary and monitoring should be implemented at a project level when construction is required.
Noise	
Reducing CO <sub>2</sub> emissions	
Adapting to changes in climate	Sea level rise and increased frequency of storm surges will be monitored.
Historic environment and archaeology	Any historical sites (monuments, listed buildings, archaeological sites etc) should be appropriately documented where they are lost or relocated as a result of the implementation of any of the policy options or where appropriate sites.
Natural landscape and seascape	Coastal processes will be monitored as part of the SMP this will monitor current processes and any changes to these and associated changes to the natural landscape as a result of the implementation of any of the policy options.
Built landscape and townscape	A record of the number of vacant residential and commercial properties should be kept.
Coastal material assets	Until the further strategies detailed strategies have been carried out to determine whether the policy options are viable appropriate monitoring measures cannot be developed. However, until these have been developed local statistics for example unemployment and house prices along the coastal areas should be continually updated and monitored to determine whether the policy options as they currently stand within the plan are having a detrimental impact.
Coastal activities and industries	
Physical and mental wellbeing	

The SMP will be subject to further testing and more detailed strategies to determine whether the implementation of each of the policy options are viable - socially, economically and environmentally. As discussed in Chapter 10 Mitigation Measures, until these detailed strategies have been carried out it is not possible to determine appropriate mitigation or appropriate detailed monitoring measures as many uncertainties surrounding the plan still remain. Therefore this report sets out the process in Figure D of how monitoring should be integrated and further developed within future reviews of the SMP once the uncertainty has been reduced.

Figure D Monitoring Strategy



# 12 Conclusion

## 12.1 Introduction

The SMP is a high level document which sets out policy options for the 24 coastal units between Kelling and Lowestoft Ness. Each of the four policy options set out by SMP guidance have been selected for each unit based on current information and knowledge of coastal processes.

## 12.2 Results of the SEA

The SEA has identified that if the policy options were to be taken forward as they stand there will be significant adverse effects on coastal material assets, coastal activities and industries and physical and mental wellbeing, which has been attributed to the loss of housing, infrastructure and associated industries within policy units where the aims are for managed realignment or no active intervention.

Within the areas where the hold line policy is proposed in the long term there may also be negative impacts on the above topics as the maintenance of the defences are likely to result in little or no beach by the long term impacting on tourism and recreation sector. These areas may also suffer from blight as a result of infrastructure loss in the surrounding areas.

The SEA has also identified beneficial impacts on coastal processes as the reduction in the amount of defences along this stretch of the coastline will allow for a more naturally functioning coastline to develop. This in itself could result in positive impacts along some sections of the SMP area as it will allow the natural beach to re-establish. The reduction of defences will also have beneficial impacts on a number of SSSI and SAC designated cliffs which are designated for their exposure.

A number of temporary negative impacts have been identified on dust, noise and water quality; however these impacts will be reduced through the implementation of appropriate mitigation measures.

At this stage of the plan's development there are still a number of uncertainties surrounding the specific implications of implementing the policy options. Therefore the plan will be subject to the more detailed coastal strategy studies set out within the SMP Action Plan. These will confirm the deliverability of these aims. If the aims are found to be deliverable they will be implemented after appropriate mitigation has been identified. If the aims are not found to be deliverable then the existing (SMP1) policy will be continued until the next review.

### 12.2.1 *Residual Effects*

As the detailed strategies have not been carried out, it has not been possible to identify specific mitigation measures, therefore at this stage it has not been possible to predict the residual effects of the assessment as they could be misconstrued. The monitoring strategy set out in Chapter 11 illustrates how updates to the SEA would be required once more detail is known and mitigation measures developed at which point the residual impacts can be presented.

## 12.3

### Next Steps

This Environmental Report will be published in May 2010 for public consultation alongside the SMP. Consultation will last for six weeks and any comments on this Environmental Report should be sent to the following address:

Nigel Pilkington  
AECOM  
Lynnfield House  
Church Street  
Altrincham  
WA14 4DZ

Or sent by email to the following:

Nigel.pilkington@aecom.com

The purpose of this consultation for this report is to establish:

- Have the environmental issues associated with this SMP been completely identified?
- Does the report use appropriate evaluation criteria in order to identify the potential effects of the plan?
- Is the information provided within the report correct?
- Have any 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 effect of the plan would be welcome as a component of consultation.

After the SMP has been adopted a Post Adoption Statement (PAS) will be produced which will detail how the SMP has taken account of the findings of the SEA.





# Appendix 1.1

This Appendix sets out a summary table for each of the 24 policy units, which summaries the results of the assessment at each of the three timeframes on these units. These summary tables present both significant adverse and beneficial impacts as well as lesser negative and positive impacts which could be short term and temporary.

## Key

Potential Effect	Evaluation Criteria
Significant Adverse effect	xx
Negative Impact	x
No Impact	=
No change from the baseline situation	~
Slight Beneficial Impact	✓
Beneficial Impact	✓✓

## Policy Unit 6.01 Kelling Hard to Sheringham

Table A1 - 6.01: Summary of the results of the assessment for Policy Unit 6.01

SEA Topic	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	✓	✓	✓
Ecosystems and biological diversity	x	x	x
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Coastal flooding	-	✓	✓
Dust	x	=	=
Noise	x	=	=
Adapting to changes in climate	x	x	x
Historic environment and archaeology	xx	xx	xx
Natural landscape and seascape	✓	✓	x
	x	x	x
Built landscape and townscape	-	x	x
Coastal material assets	-	x	x
Coastal activities and industries	x	x	x
Physical and mental wellbeing	x	x	xx

Policy Unit 6.02 Sheringham**Table A1 - 6.02: Summary of the results of the assessment for Policy Unit 6.02**

Key areas for consideration derived from the SEA Directive topics.	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	
Sediment, geology, and geomorphology (coastal processes)	-	x	xx
Coastal flooding	-	x	x
Dust	x	x	x
Noise	x	x	x
Reducing CO <sub>2</sub> Emissions	-	x	x
Adapting to changes in climate	✓	✓	✓
Natural landscape and seascape	-	x	xx
Built landscape and townscape	-	✓	x ✓
Coastal material assets	-	✓	✓
Coastal activities and industries	-	x	x
Physical and mental wellbeing	✓	✓	x ✓

Policy Unit 6.03 Sheringham to Cromer**Table A - 6.03: Summary of the results of the assessment for Policy Unit 6.03**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	✓	✓	✓
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Coastal flooding	-	✓	✓
Dust	x	=	=
Noise	x	=	=
Adapting to changes in climate	-	x	x
Historic environment and archaeology	=	xx	=
Built landscape and townscape	-	x	x
Coastal material assets	x	x	x
Coastal activities and industries	x	x	x
Physical and mental wellbeing	x	x	xx

Policy Unit 6.04 Cromer**Table A1 – 6.04: Summary of the results of the assessment for Policy Unit 6.04**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	x	x	xx
Coastal flooding	-	x	x
Dust	x	x	x
Noise	x	x	x
Reducing CO <sub>2</sub> Emissions	-	x	x
Adapting to changes in climate	✓	✓	✓
Historic environment and archaeology	=	x	x
Natural landscape and seascape	-	x	xx
Built landscape and townscape	-	x	x
Coastal material assets	✓	x	x
Coastal activities and industries	-	x	x
Physical and mental wellbeing	✓	✓	✓
	✓	✓	x

Policy Unit 6.05 Cromer to Overstrand**Table A1 - 6.05: Summary of the results of the assessment for Policy Unit 6.05**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	✓	✓✓	✓
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓
Coastal flooding	-	✓	✓
Adapting to changes in climate	-	x	x
Natural landscape and seascape	✓	✓	✓
	x	x	x
Coastal material assets	-	x	x
Coastal activities and industries	x	x	x
Physical and mental wellbeing	-	x	x

Policy Unit 6.06 Overstrand**Table A1- 6.06: Summary of the results of the assessment for Policy Unit 6.06**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	✓	✓
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Water quality	x	xx	x
Coastal flooding	-	-	✓
Dust	x	=	=
Noise	x	=	=
Reducing CO <sub>2</sub> Emissions	x	x	x
Adapting to changes in climate	✓	x	x
Historic environment and archaeology	=	xx	xx
Natural landscape and seascape	-	-	✓
Built landscape and townscape	x	xx	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	-	x	xx
Physical and mental wellbeing	x	xx	xx

Policy Unit 6.07 Overstrand to Mundesley**Table A1 – 6.0.7: Summary of the results of the assessment for Policy Unit 6.07**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	✓	✓	✓
Ecosystems and biological diversity	x	x	x
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Coastal flooding	-	-	✓
Reducing CO <sub>2</sub> Emissions	-	=	=
	x	=	=
Adapting to changes in climate	-	x	x
Historic environment and archaeology	=	=	x
Natural landscape and seascape	✓	✓	✓
	x	x	x
Built landscape and townscape	x	xx	xx
Coastal material assets	x	xx	xx

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	x	xx	xx

### Policy Unit 6.08 Mundesley

**Table A1 - 6.08: Summary of the results of the assessment for Policy Unit 6.08**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	✓	x
Ecosystems and biological diversity	-	-	x
Sediment, geology, and geomorphology (coastal processes)	x	x	✓
Water quality	-	-	x
Coastal flooding	-	x	✓
Dust	x	=	=
Noise	x	=	=
Reducing CO <sub>2</sub> Emissions	x	x	x
Adapting to changes in climate	✓	✓	x
Historic environment and archaeology	=	=	x
Natural landscape and seascape	-	x	✓
Built landscape and townscape	x	x	xx
Coastal material assets	x ✓	x ✓	xx
Coastal activities and industries	-	✓	xx
Physical and mental wellbeing	✓	✓	xx

### Policy Unit 6.09 Mundesley to Bacton Gas Terminal

**Table A1 – 6.09: Summary of the results of the assessment for Policy Unit 6.09**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	✓	✓	✓
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Coastal flooding	-	✓	✓
Adapting to changes in climate	-	x	x
Historic environment and archaeology	x	xx	xx
Natural landscape and seascape	✓	✓	✓

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
	x	x	x
Built landscape and townscape	x	x	xx
Coastal material assets	x	x	xx
Coastal activities and industries	x	x	xx
Physical and mental wellbeing	x	xx	xx

### Policy Unit 6.10 Bacton Gas Terminal

**Table A1 – 6.10: Summary of the results of the assessment for Policy Unit 6.10**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	✓
Ecosystems and biological diversity	x	x	-
Sediment, geology, and geomorphology (coastal processes)	x	x	✓
Coastal flooding	-	x	✓
Dust	x	x	=
Noise	x	x	=
Reducing CO <sub>2</sub> Emissions	x	x	x
Adapting to changes in climate	✓	✓	x
Natural landscape and seascape	x	x	x
	x	x	✓
Built landscape and townscape	-	-	x
Coastal material assets	✓	✓	x
Coastal activities and industries	-	-	x
Physical and mental wellbeing	-	-	x

### Policy Unit 6.11 Bacton, Walcott and Ostend

**Table A1 – 6.11: Summary of the results of the assessment for Policy Unit 6.11**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected Sites and Species	-	-	xx
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Water quality	x	x	x
Coastal flooding	-	✓	✓
Dust	x	=	=

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Noise	x	=	=
Reducing CO <sub>2</sub> Emissions	x	x	x
Adapting to changes in climate	✓	x	x
Historic environment and archaeology	xx	=	=
Natural landscape and seascape	-	x	x
Built landscape and townscape	xx	xx	xx
Coastal material assets	xx	xx	xx
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	xx	xx	xx

### Policy Unit 6.12 Ostend to Eccles

**Table A1- 6.12: Summary of the results of the assessment for Policy Unit 6.12**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	✓	✓	✓
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Water quality	x	x	x
Coastal flooding	-	✓	✓
Adapting to changes in climate	-	x	x
Historic environment and archaeology	=	x	xx
Natural landscape and seascape	-	✓	✓
Built landscape and townscape	x	x	xx
Coastal material assets			
Coastal activities and industries			
Physical and mental wellbeing			

### Policy Unit 6.13 Eccles to Winterton Beach Road

**Table A1 - 6.13: Summary of the results of the assessment for Policy Unit 6.13**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	-	x	xx
Sediment, geology, and geomorphology (coastal processes)	x	x	x
Dust	x	x	x
Noise	x	x	x
Reducing CO <sub>2</sub> Emissions	-	x	x

Adapting to changes in climate	✓	✓	✓
Natural landscape and seascape	✓	✓	✓
	x	x	x
Coastal activities and industries	-	-	x
Physical and mental wellbeing	✓	✓	✓

*Policy Unit 6.14 Winterton (south of Beach Road) to Scratby*

**Table A1 – 6.14: Summary of the results of the assessment for Policy Unit 6.14**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	xx
Ecosystems and biological diversity	x		xx
Water quality	x	x	x
Coastal flooding	-	✓	✓
Adapting to changes in climate	x	x	x
Built landscape and townscape	x	xx	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	-	x	xx
Physical and mental wellbeing	x	xx	xx

*Policy Unit 6.15 California to Caister-on-Sea*

**Table A1 – 6.15: Summary of the results of the assessment for Policy Unit 6.15**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	xx
Ecosystems and biological diversity	x	x	xx
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓
Water quality	-	x	x
Coastal flooding	-	✓	✓
Dust	x	=	=
Noise	x	=	=
Reducing CO <sub>2</sub> Emissions	x	x	x
Adapting to changes in climate		x	x
Natural landscape and seascape	-	-	✓
Built landscape and townscape	x	xx	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	-	x	xx
Physical and mental wellbeing	x	xx	xx



Policy Unit 6.16 Caister-on-Sea**Table A1 – 6.16: Summary of the results of the assessment for Policy Unit 6.16**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	x	xx
Ecosystems and biological diversity	x	x	xx
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓
Water quality	-	-	x
Coastal flooding	-	-	✓
Dust	x	x	=
Noise	x	x	=
Reducing CO <sub>2</sub> Emissions	x	x	x
Adapting to changes in climate	✓	✓	x
Natural landscape and seascape	-	x	✓
Built landscape and townscape	-	-	xx
Coastal material assets	-	-	xx
Coastal activities and industries	-	-	xx
Physical and mental wellbeing	✓	✓	xx

Policy Unit 6.17 Great Yarmouth**Table A1 – 6.17: Summary of the results of the assessment for Policy Unit 6.17**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	-	x	xx
		✓	✓✓
Sediment, geology, and geomorphology (coastal processes)	-	x	x
Coastal flooding	-	x	x
Dust	x	x	x
Noise	x	x	x
Reducing CO <sub>2</sub> Emissions	-	x	x
Adapting to changes in climate	✓	✓	✓
Natural landscape and seascape	-	x	x
Built landscape and townscape	-	-	x
Coastal material assets	✓	✓	✓
Coastal activities and industries	-	-	x
Physical and mental wellbeing	✓	✓	x
			✓

Policy Unit 6.18 Gorleston**Table A1 - 6.18: Summary of the results of the assessment for Policy Unit 6.18**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	x	x
Coastal flooding	-	x	x
Dust	x	x	x
Noise	x	x	x
Reducing CO <sub>2</sub> Emissions	-	x	x
Adapting to changes in climate	✓	✓	✓
Natural landscape and seascape	-	x	x
Built landscape and townscape	-	-	x
Coastal material assets	✓	✓	✓
Coastal activities and industries	-	-	x
Physical and mental wellbeing	✓	✓	x ✓

Policy Unit 6.19 Gorleston to Hopton**Table A1 – 6.19: Summary of the results of the assessment for Policy Unit 6.19**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	✓	✓✓
Coastal flooding	-	✓	✓
Adapting to changes in climate	-	x	x
Natural landscape and seascape	-	✓	✓
Coastal material assets	-	x	x
Coastal activities and industries	x	x	x
Physical and mental wellbeing	x	x	x

Policy Unit 6.20 Hopton**Table A1 – 6.20: Summary of the results of the assessment for Policy Unit 6.20**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	x	✓	✓✓
Water quality	x	x	x
Coastal flooding	x		
Dust	x	=	=
Noise	x	=	=

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Reducing CO <sub>2</sub> Emissions	x	=	=
Adapting to changes in climate	✓	x	x
Natural landscape and seascape	-	✓	✓
Built landscape and townscape	-	x	xx
Coastal material assets	x	xx	xx
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	x	xx	xx

### Policy Unit 6.21 Hopton to Corton

**Table A1 – 6.21: Summary of the results of the assessment for Policy Unit 6.21**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Water quality	-	-	x
Coastal flooding	-	✓	✓
Adapting to changes in climate	-	x	x
Natural landscape and seascape	-	✓	✓
		x	x
Coastal material assets	-	-	
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	x	x	xx

### Policy Unit 6.22 Corton

**Table A1 – 6.22: Summary of the results of the assessment for Policy Unit 6.22**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	✓	✓
Sediment, geology, and geomorphology (coastal processes)	x	✓	✓✓
Water quality	-	x	x
Coastal flooding	x	✓	✓
Dust	x	x	x
Noise	x	x	x
Reducing CO <sub>2</sub> Emissions	x	x	x
Adapting to changes in climate	✓	x	x
Historic environment and archaeology	=	xx	xx
Natural landscape and seascape	-	✓	✓

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Built landscape and townscape	-	x	xx
Coastal material assets	-	xx	xx
Coastal activities and industries	x	xx	xx
Physical and mental wellbeing	-	xx	xx

*Policy Unit 6.23 Corton to Lowestoft*

**Table A1 – 6.23: Summary of the results of the assessment for Policy Unit 6.23**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Protected sites and species	x	xx	xx
Ecosystems and biological diversity	x	xx	xx
Sediment, geology, and geomorphology (coastal processes)	-	✓✓	✓✓
Water quality	x	x	xx
Coastal flooding	-	✓	✓
Adapting to changes in climate	-	x	x
Natural landscape and seascape	-	✓	✓
Coastal material assets	x	x	x
Coastal activities and industries	x	x	x
Physical and mental wellbeing	-	x	x

*Policy Unit 6.24 Lowestoft North (to Ness Point)*

**Table A1 – 6.24: Summary of the results of the assessment for Policy Unit 6.24**

Key areas for consideration derived from the SEA Directive topics	Short Term by 2025	Medium Term by 2055	Long Term by 2105
Sediment, geology, and geomorphology (coastal processes)	x	x	xx
Coastal flooding	x	x	xx
Dust	x	x	x
Noise	x	x	x
Reducing CO <sub>2</sub> Emissions	-	x	x
Adapting to changes in climate	✓	✓	✓
Natural landscape and seascape	-	x	xx
Built landscape and townscape	-	-	x
Coastal material assets	✓	✓	
Coastal activities and industries	-	x	x
Physical and mental wellbeing	✓	✓	x

# Appendix 1.2

Table A1.2: Assessment Matrix

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
6.01— Kelling Hard to Sheringham	NAI Scenario for 6.01 – Kelling Hard to Sheringham																		
	The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same.																		
	Short term	No active intervention – no defences (apart from timber /steel palisade at Weybourne retained to prevent breach and flooding	✓	✖	~	~	~	✖	✖	=	✖	✖✖	✓	✖	~	~	✖	✖	<ul style="list-style-type: none"><li>■ No loss of Cliff top residential properties at Weybourne or Weybourne Priory</li><li>■ Some Heritage sites will be lost including some coastal monument site of high importance</li><li>■ Loss of farmland</li><li>■ Continued erosion therefore exposure of Weybourne Cliffs SSSI will be maintained</li><li>■ Minimum loss of Kelling Hard CWS</li><li>■ Minimum loss of Beach Lane CWS but shingle ridge allowed to roll back</li><li>■ Beach will be similar to present</li><li>■ Minimum loss to the car park at Beach lane, no loss to the beach access</li><li>■ Loss of land at Sheringham Golf Links</li><li>■ Loss of parts of Peddlers Way &amp; Norfolk Coast path but could be relocated</li><li>■ Landscape of the AONB maintained through natural cliff erosion.</li><li>■ Character of the AONB may be affected by loss of property.</li></ul>
Medium term	No active intervention – No defences (Natural shingle bank at Weybourne	✓	✖	✓✓	~	✓	=	=	=	✖	✖✖	✓	✖	✖	✖	✖	✖	✖	<ul style="list-style-type: none"><li>■ Loss of some Coastguard cottages at Weybourne</li><li>■ No loss to Weybourne Priory</li><li>■ Further heritage sites will be lost including some coastal monument site of high importance</li><li>■ Loss of farmland</li><li>■ Continued erosion therefore exposure of Weybourne Cliffs SSSI will be maintained</li><li>■ Less than 50% loss of Kelling Hard CWS</li><li>■ Some loss of Beach Lane CWS but shingle ridge allowed to roll back</li><li>■ Beach will be similar to present</li><li>■ 50% of Beach Lane car park lost but low lying land therefore car park could be moved landwards</li><li>■ No loss of beach access</li><li>■ Further loss of golf course land</li><li>■ Further loss of Peddlers Way &amp; Norfolk Coast Path but could be relocated</li><li>■ AONB landscape maintained through natural erosion.</li><li>■ Character of the AONB may be affected by loss of property.</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
	Long Term	No active intervention – No defences (Natural shingle bank at Weybourne	✓	*	✓✓	~	✓	=	=	=	*	**	✓	*	*	*	*	**	<ul style="list-style-type: none"><li>■ Total loss of Coastguard Cottages at Weybourne</li><li>■ No loss of Weybourne Priory</li><li>■ Further heritage sites lost including some coastal monument site of high importance</li><li>■ Loss of farm land</li><li>■ Continued erosion of Weybourne Cliffs SSSI therefore exposures maintained</li><li>■ Partial loss of Kelling Hard CWS</li><li>■ Some loss of Beach Lane CWS but shingle ridge allowed to roll back</li><li>■ Beach present</li><li>■ Total loss of car park, but could be relocated</li><li>■ No loss of beach access</li><li>■ Further loss of Sheringham Golf Links land</li><li>■ Further loss of parts of Paddlers Way &amp; Norfolk Coast Path but could be relocated</li><li>■ AONB landscape maintained through natural cliff erosion.</li><li>■ Character of the AONB may be affected by loss of property.</li></ul>
6.02 –Sheringham	NAI Scenario for 6.02 – Sheringham																		
	If the policy were not implemented the timber groynes and seawalls to the east and west will fail in the short term (before 2025). The seawall and rock groynes in front of the town would remain in place in the short and the majority of the medium term (up to 2055). However, in the long term this seawall and rock groynes will fail. Therefore at Sheringham in the short term Beeston Regis Hill and other monument sites would be lost, a small area of unimproved grassland which is part of the SSSI would also be lost. In the medium term the promenade properties would become more exposed, there would be further loss to the unimproved cliff top grassland and little or no beach along the main frontage. However, in the long term once the existing seawall and rock groynes have failed there would be a loss of over 400 residential properties and over 100 commercial properties and their associated services. Loss of the main town streets and town centre car parks, loss of the promenade, seafront shops and amenities, loss of access roads within the town and loss of the lifeboat station on the promenade. The lack of defences however, will allow for continued exposure of the SSSI, reestablishment of a beach along the main frontage and allow for the natural coastal processes to take place.																		
	Short term	Hold the existing line – Seawall and groynes maintained to prevent any erosion	*	~	~	~	~	*	*	~	✓	=	~	~	~	~	~	✓	<ul style="list-style-type: none"><li>■ No loss of residential, commercial properties, community facilities, heritage sites, recreation and tourist facilities and infrastructure.</li><li>■ No loss of the Lifeboat station, and the slipway will remain functional</li><li>■ No cliff erosion therefore poor exposure of Beeston Cliffs SSSI</li><li>■ Cliff top grassland preserved</li><li>■ Similar beach to present</li><li>■ No change to the national trail location</li><li>■ Beach access as present.</li></ul>
Medium term	Hold the existing line – Seawall and groynes maintained to prevent any erosion	*	~	*	~	*	*	*	*	✓	=	*	✓	✓	*	*	✓	<ul style="list-style-type: none"><li>■ No loss of residential, commercial properties, community facilities, heritage sites and infrastructure.</li><li>■ No loss to tourist and recreation facilities but promenade properties more exposed.</li><li>■ No loss of the Lifeboat station, and the slipway will remain functional</li><li>■ No cliff erosion therefore poor exposure of Beeston Cliffs SSSI</li><li>■ Cliff top grassland preserved</li><li>■ Little or no beach</li><li>■ No change to the national trail location</li><li>■ Beach access as present.</li></ul>	

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics																Comments
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
	Long Term	Hold the existing line – Seawall and groyne maintained to prevent any erosion	xx	~	xx	~	*	*	*	*	✓	=	xx	✓	*	✓	*	✓	<ul style="list-style-type: none"><li>No loss of residential, commercial properties, community facilities, heritage sites and infrastructure.</li><li>No loss to tourist and recreation facilities but promenade properties more exposed.</li><li>Increased risk of the lifeboat station building being overtopped – slipway will be functional</li><li>No cliff erosion therefore poor exposure of Beeston Cliffs SSSI</li><li>Cliff top grassland preserved</li><li>No beach</li><li>No change to the national trail location</li><li>Beach access possible, but no beach</li></ul>
6.03 – Sheringham to Cromer																			
NAI scenario for policy unit 6.03 – Sheringham to Cromer The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same.																			
	Short term	No active intervention – Timber groyne between Sheringham and West Runton allowed to fail. Two short masonry wall at Gaps maintained	✓	~	~	~	~	*	*	=	~	=	~	~	*	*	*	*	<ul style="list-style-type: none"><li>No cliff top properties lost at East Runton but potential loss of land</li><li>Partial loss of caravan park land</li><li>No loss of heritage sites identified as high importance</li><li>Loss of farmland</li><li>Continued exposure of cliffs at West and East Runton therefore improved exposure of the SSSI</li><li>Loss of car park at West Runton and partial loss of car park at East Runton</li><li>Beach access maintained</li><li>Similar beach as present</li></ul>
	Medium term	No active intervention – Short stretches of masonry wall at Gaps allowed to fail	✓	~	✓	~	✓	=	=	=	*	xx	~	*	*	*	*	*	<ul style="list-style-type: none"><li>Less than 5 cliff top properties lost at East Runton but potential loss of land</li><li>Further loss of caravan park land</li><li>Loss of one heritage site of high importance and other sites</li><li>Further loss of farmland</li><li>Continued exposure of cliffs at West and East Runton therefore improved exposure of the SSSI</li><li>Loss of car park at East Runton</li><li>Access lost to beach at outflanking but possible relocation</li><li>Similar beach as present</li></ul>
	Long Term	No active intervention – No defences	✓✓	~	✓✓	~	✓	=	=	=	*	~	~	*	*	*	xx	xx	<ul style="list-style-type: none"><li>Seafront properties lost at East Runton but potential loss of land</li><li>Further loss of caravan park land</li><li>No further loss of heritage sites</li><li>Further loss of farmland</li><li>Continued exposure of cliffs at West and East Runton therefore improved exposure of the SSSI</li><li>Similar beach as present</li></ul>



Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
6.04 – Cromer	<b>NAI scenario for policy unit 6.04 – Cromer</b> If the policies were not implemented along this policy unit in the short term the seawall will remain in place along most of the frontage and the groynes will start to fail towards the end of this timeframe resulting in the beach becoming narrower. In the medium term it is expected that there would be a complete failure of the seawall at the beginning of this timeframe. This would result in the loss of over 250 residential and over 100 commercial properties and their associated infrastructure. Loss of the promenade, grade II listed properties, important monument sites, church, post office, museum , lifeboat station, link roads, a section of the A149, grade II listed seawall itself and the structural integrity of the pier would be threatened. In the long term there would be no defences present, and further loss of residential properties, commercial properties, heritage sites, community facilities, town centre roads and the A149. The main town seafront and the pier will also be lost. The lack of defences however, will allow the beach to be maintained and natural coastal processes to take place.																		
	Short term	Hold the existing line – Seawall and groynes maintained to prevent any erosion	~	~	*	~	~	*	*	~	✓	=	~	~	✓	~	✓	<ul style="list-style-type: none"><li>No loss of residential and commercial properties, commercial properties on the promenade, heritage sites, community facilities, recreational and tourist facilities, pier, lifeboat station, infrastructure, main road at Cromer (A149), sea wall and access to the beach</li><li>Narrower beach</li></ul>	
	Medium term	Hold the existing line – Seawall and groynes maintained to prevent any erosion	~	~	*	~	*	*	*	*	✓	*	*	*	*	✓	*	✓	<ul style="list-style-type: none"><li>No loss of residential and commercial properties, heritage sites, community facilities, recreational and tourist facilities, infrastructure and the main road at Cromer (A149)</li><li>Increased risk of overtopping of commercial properties on the promenade</li><li>Structural integrity of the pier threatened by the sea level rise and dropping of beach levels</li><li>Structural integrity of the lifeboat station threatened</li><li>Possible structural maintenance problems of the sewage pumping station on the promenade</li><li>Work required to maintain the structural integrity of the sea wall which may affect its listing</li><li>Little or no beach</li><li>Access to promenade, but little or no beach</li></ul>
	Long Term	Hold the existing line – Seawall and groynes maintained to prevent erosion	~	~	**	~	*	*	*	*	✓	*	**	*	*	✓	*	*	<ul style="list-style-type: none"><li>No loss of residential and commercial properties, heritage sites, community facilities, recreational and tourist facilities, infrastructure and the main road at Cromer (A149)</li><li>Increased risk of overtopping of commercial properties on the promenade</li><li>Structural integrity of the pier threatened by the sea level rise and dropping of beach levels</li><li>Structural integrity of the lifeboat station threatened</li><li>Work required to maintain the structural integrity of the sea wall which may affect its listing</li><li>No beach</li><li>Access to promenade but no beach</li></ul>
6.05 – Cromer to Overstrand	<b>NAI scenario for policy unit 6.05 – Cromer to Overstrand</b> The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same.																		
	Short term	No active intervention – Revetments and timber groynes allowed to fail	✓	~	~	~	~	=	=	=	~	=	✓	*	~	~	*	~	<ul style="list-style-type: none"><li>No loss of Royal Cromer Golf Course</li><li>Cliffs are designated as unprotected SAC therefore continued erosion will support this</li><li>Paston footpath lost, but possibility for re-routing</li><li>Beach present</li><li>AONB landscape maintained through natural cliff erosion</li><li>Character of the AONB may be affected by change in land use associated with the golf course.</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
	Medium term	No active intervention – No defences	✓✓	~	✓✓	~	✓	=	=	=	*	=	✓	*	~	*	*	*	<ul style="list-style-type: none"><li>■ Loss of part of the Royal Cromer Golf Course</li><li>■ Cliffs are designated as unprotected SAC therefore continued erosion will support this</li><li>■ Paston footpath lost, but possibility for re-routing</li><li>■ Beach present but possible access issue</li><li>■ AONB landscape maintained through natural cliff erosion</li><li>■ Character of the AONB may be affected by change in land use associated with the golf course.</li></ul>
	Long Term	No active intervention – No defences	✓	~	✓	~	✓	=	=	=	*	=	✓	*	~	*	*	*	<ul style="list-style-type: none"><li>■ Further loss of part of the Royal Cromer Golf Course</li><li>■ Cliffs are designated as unprotected SAC therefore continued erosion will support this</li><li>■ Paston footpath lost, but possibility for re-routing</li><li>■ Beach present but possible access issue</li><li>■ AONB landscape maintained through natural cliff erosion</li><li>■ Character of the AONB may be affected by change in land use associated with the golf course.</li></ul>
6.06 – Overstrand	NAI scenario for policy unit 6.06 – Overstrand																		
	If no policies where implemented the effects will be brought forward as the seawall, timber revetment and groynes will all fail in the short term. This will result in the loss of over 30 residential properties, less than 5 commercial properties, the ‘Sea Marge’, a School, the Jubilee ground, the promenade, seafront facilities, services, link roads within Overstrand, car park and the possibility the pumping station will also be lost in the short term. In the medium term there will be a further loss of over 20 houses, 1 commercial property, community facilities, tourist facilities, further loss of link roads and services and the loss of the pumping station. In the long term the impacts will largely be the same as those identified below .																		
	Short term	Hold the existing line – Seawall, timber revetment and groynes maintained	*	~	~	*	~	*	*	*	✓	=	~	*	*	~	*	<ul style="list-style-type: none"><li>■ Loss of less than 5 residential properties to the south of Overstrand</li><li>■ No loss of commercial properties, heritage sites or community facilities</li><li>■ Loss of Jubilee Ground but promenade remains</li><li>■ Services lost at southern end only</li><li>■ Access roads to houses lost, not link roads</li><li>■ Sewers lost with houses at the southern end of the village</li><li>■ No change to the Overstrand Sea Front County Wildlife Site</li><li>■ No change to beach access from present</li><li>■ Part of car park lost</li></ul>	
Medium term	Managed realignment – Seawall, timber revetment and groynes allowed to deteriorate	✓	~	✓	**	~	=	=	*	*	**	~	**	**	*	**	<ul style="list-style-type: none"><li>■ Loss of over 50 residential seafront houses</li><li>■ Loss of part of the high street with less than 10 properties lost</li><li>■ Loss of ‘Sea Marge’</li><li>■ Loss of school</li><li>■ Loss of promenade and other tourist facilities along Overstrand seafront</li><li>■ Services lost with properties</li><li>■ Road linkages within village lost with properties</li><li>■ Pumping station lost</li><li>■ Ecological interest associated with slumped cliff, therefore may improve the CWS status</li><li>■ Beach access at Overstrand lost</li><li>■ Car park lost</li></ul>		

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health	
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing	
	Long Term	Managed realignment – No defences	✓	~	✓✓	✖	✓	=	=	✖	✖	✖✖	✓	✖✖	✖✖	✖✖	✖✖	<ul style="list-style-type: none"><li>Further loss of 70 houses with village</li><li>Loss of less than 5 commercial properties</li><li>Loss of ‘The Pleasance’</li><li>Loss of community facilities buildings and land</li><li>Further loss of tourist facilities along Overstrand seafront</li><li>Services lost with properties</li><li>Further road linkages within village lost with properties</li><li>Ecological interest associated with slumped cliff, therefore may improve the CWS status</li><li>No beach access</li><li>No car park</li></ul>
6.07 – Overstrand to Mundesley	NAI scenario for policy unit 6.07 – Overstrand to Mundesley																	
	The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same.																	
	Short term	No active intervention – Timber revetment and groyne to North of Beach Vale Rd allowed to fail. To south Timber revetment and groyne maintained / replaced	✓	✖	~	~	~	=	=	=	✖	~	=	✓	✖	✖	✖	✖
Medium term	No active intervention – Timber revetment and groyne allowed to deteriorate and fail	✓	✖	✓	~	~	=	=	=	✖	=	✓	✖	✖✖	✖✖	✖✖	✖✖	<ul style="list-style-type: none"><li>Some property loss (less than 5) to the north of Sidestrand</li><li>Some property loss at Trimingham (more than 20)</li><li>No loss of community facilities or MoD communications facility</li><li>Loss of a section of the main coast road</li><li>Further loss of farmland</li><li>Continued erosion maintaining geological exposure of SSSI designated cliffs</li><li>Invertebrates associated with crevices and fallen debris therefore erosion should improve status</li><li>Possible loss of cliff top habitats due to coastal squeeze</li><li>Beach present but limited access</li><li>Total loss of caravan parks</li><li>AONB Landscape maintained trough natural cliff erosion</li><li>Character of the AONB impact ted by the loss of properties</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
	Long Term	No active intervention – No defences	✓	*	✓✓	~	✓	=	=	=	*	*	✓	*	**	**	**	**	<ul style="list-style-type: none"><li>Some property loss (more than 10) at Sidestrand</li><li>More than 40 houses lost at Trimingham</li><li>Trimingham Church lost</li><li>Loss of MoD communications facility but could be relocated</li><li>Further loss of main coast road</li><li>Further loss of farmland</li><li>Continued erosion maintaining geological exposure of SSSI designated cliffs</li><li>Invertebrates associated with crevices and fallen debris therefore erosion should improve status.</li><li>Possible loss of cliff top habitats due to coastal squeeze</li><li>Beach present but limited access</li><li>AONB landscape maintained through natural cliff erosion.</li><li>Character of the AONB impact ted by the loss of properties</li></ul>
6.08 – Mundesley	NAI scenario for policy unit 6.08 – Mundesley If the policies were not implemented within this unit the existing defences will largely remain in place until the end of the short term, the seawall will fail to the start of the medium term and there will be no defences present in the long term. This would result in the loss of more than 20 houses and less than 5 commercial properties to the north, loss of the library, and the loss of services with properties in the short term. As the defences will remain in place for the majority of this timeframe the beach will also become narrower. The failure of the defences in the medium term will result in the loss of a further 70 residential and 20 commercial properties, All Saint’s Church, a monument site, museum, seafront facilities, further services, a section of the road within the town centre and the Lifeboat station will also be lost. In the long term there will be the further loss of more than 110 residential and less than 10 commercial properties, Brick Kiln and Grade II listed building, further facilities and services and further loss the road. The failure of the defences early on without the implementation of the policies will allow natural coastal process to take place which will allow for replenishment of the beach and supply of sediment to the downdrift areas.																		
	Short term	Hold the existing line – Seawall and groynes maintained	*	~	*	~	~	*	*	*	✓	=	~	*	*	✓	~	*	<ul style="list-style-type: none"><li>Loss of less than 5 properties at Cliftonville</li><li>No loss of commercial properties, heritage sites, community facilities, infrastructure and the B1159 at Mundesley</li><li>Lifeboat station will remain</li><li>Beach will become narrower</li></ul>
	Medium term	Hold the existing line – Seawall (and groynes until redundant maintained	✓	~	*	~	*	=	=	*	✓	=	*	*	*	✓	*	*	<ul style="list-style-type: none"><li>No further loss of properties</li><li>No loss of commercial properties, heritage sites, community facilities, infrastructure, and the B1159 at Mundesley</li><li>Lifeboat station will remain but increased risk of overtopping</li><li>No beach</li></ul>
	Long Term	Managed realignment – Seawall allowed to fail	✓	*	✓	*	✓	=	=	*	*	*	✓	**	**	**	**	**	<ul style="list-style-type: none"><li>Loss of over 200 houses</li><li>Loss of more than 30 commercial properties</li><li>Loss of heritage sites</li><li>Some loss of community facilities</li><li>Services lost with properties</li><li>Loss of main links</li><li>Lifeboat station will remain but possible issue with launching due to drop in beach levels</li><li>Beach in retreated position</li><li>Improved exposure of the cliffs</li><li>Some loss to cliff top grassland and the CWS</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
6.09 – Mundesley to Bacton Gas Terminal	NAI scenario for policy unit 6.09 – Mundesley to Bacton Gas Terminal The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same.																		
	Short term	No active intervention – Timber revetment and groyne allowed to fail	✓	~	~	~	~	=	=	=	~	*	✓	*	*	*	*	*	<ul style="list-style-type: none"><li>No loss of Hillside Chalet Camp, but partial loss of Mundesley Holiday Camp (first purpose built holiday camp in the UK)</li><li>Loss of less than 10 seafront properties at the southern end of Mundesley</li><li>Loss of farmland</li><li>Continued erosion maintaining geological exposure of SSSI designated cliffs</li><li>Beach similar to present</li><li>Loss of Paston way footpath but could be relocated</li><li>AONB landscape maintained through natural cliff erosion</li><li>Character of the AONB impacted by the loss of properties and farmland</li></ul>
	Medium term	No active intervention – No defences	✓	~	✓✓	~	✓	=	=	=	*	**	✓	*	*	*	*	*	<ul style="list-style-type: none"><li>Hillside Chalet Camp close to cliff edge</li><li>Cumulative loss of less than 15 properties at the southern end of Mundesley</li><li>Loss of a Saxon cemetery which has high heritage value</li><li>Partial loss of Mundesley Holiday Camp</li><li>Loss of heritage site</li><li>Further loss of farmland</li><li>Continued erosion maintaining geological exposure of SSSI designated cliffs</li><li>Beach similar to present</li><li>Loss of Paston way footpath but could be relocated</li><li>AONB landscape maintained through natural cliff erosion</li><li>Character of the AONB impacted by the loss of properties and farmland</li></ul>
	Long Term	No active intervention – No defences	✓	~	✓✓	~	✓	=	=	=	*	**	✓	*	**	**	**	**	<ul style="list-style-type: none"><li>Camps lost</li><li>Cumulative loss of less than 55 properties at the southern end of Mundesley</li><li>Further loss of farmland</li><li>Continued erosion maintaining geological exposure of SSSI designated cliffs</li><li>Beach present but possible access problems</li><li>Loss of Paston way footpath but could be relocated</li><li>AONB landscape maintained through natural cliff erosion</li><li>Character of the AONB impacted by the loss of properties and farmland</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health	
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing	
6.10 – Bacton Gas Terminal	NAI scenario for policy unit 6.10 – Bacton Gas Terminal																	
	If the policy of hold the line were not implemented during the with the short and medium terms the groynes and timber revetment would fail in the short term and result in losses to the terminal site at an earlier timeframe.																	
	Short term	Hold the existing line – Timber revetment replaced by seawall and groynes maintained	*	*	*	~	~	*	*	*	✓	=	*	~	✓	~	~	<ul style="list-style-type: none"><li>■ Loss of gas terminal land but facility will remain</li><li>■ Cliff line held, therefore poor exposure of SSSI site</li><li>■ Defences possibly detrimental to habitats</li><li>■ Negative impact on the AONB associated with the poor exposure of the SSSI</li></ul>
	Medium term	Hold the existing line – Seawall and timber groynes maintained	*	*	*	~	*	*	*	*	✓	=	*	~	✓	~	~	<ul style="list-style-type: none"><li>■ No loss of gas terminal but possible issues due to drop in beach volume</li><li>■ Cliff line held, therefore poor exposure of SSSI site</li><li>■ Defences possibly detrimental to habitats</li><li>■ Negative impact on the AONB associated with the poor exposure of the SSSI</li></ul>
	Long Term	Managed realignment – Measures to reduce erosion rate	✓	~	✓	~	✓	=	=	*	*	=	✓	*	*	*	*	<ul style="list-style-type: none"><li>■ Loss of seaward edge of terminal site</li><li>■ Cliff erosion will enhance geological exposure therefore benefiting the SSSI site</li><li>■ Positive impact on the AONB associated with the exposure of the SSSI</li><li>■ Character of the AONB could be affected by the loss of part of the gas terminal which falls within its remit.</li></ul>
6.11 – Bacton, Walcott and Ostend	NAI scenario for policy unit 6.11 – Bacton, Walcott and Ostend																	
	If the policies were not to be implemented along this section of the coast timber groynes would fail towards the start of the short term and the seawall towards the end of the short term timeframe. This would result in the loss of over 100 residential and less than 10 commercial properties, loss of land belonging to the caravan parks at Bacton, seaward holiday and residential properties at Ostend, Ostend House, and roads at Walcott and between Bacton and Walcott. In the medium term there would be no defences present and a further loss of over 90 residential and less than 10 commercial properties, loss of most of the caravan parks and further loss of holiday and residential properties at Ostend. In the long term the effects would largely be the same as those presented below for the same timeframe.																	
	Short term	Hold the existing line – Seawall and timber groynes maintained	~	~	~	*	~	*	*	*	✓	**	~	**	**	*	**	<ul style="list-style-type: none"><li>■ Loss of less than 40 properties at Ostend</li><li>■ No loss of commercial properties</li><li>■ No loss of caravan parks</li><li>■ Loss of some seaward holiday and residential properties at Ostend</li><li>■ Heritage building lost (Ostend House which is listed on the SMR register)</li><li>■ No loss of the B1159 at Walcott No change to flooding from overtopping and spray</li><li>■ No loss to beach access</li><li>■ Beach similar to present</li></ul>



Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics														Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population		Human Health
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries		Physical and mental wellbeing
	Medium term	Managed realignment – Seawall and timber groynes allowed to deteriorate and fail	~	~	✓	*	✓	=	=	*	*	=	✓	**	**	**	**	<ul style="list-style-type: none"><li>■ Loss of further 160 houses over whole frontage</li><li>■ Over 15 commercial properties lost</li><li>■ Some loss of land and Cliff-top caravan park at Bacton</li><li>■ Further loss of residential and holiday properties at Ostend</li><li>■ Loss of B 1159 access road and high risk at Bacton (but possibility of re-routing road)</li><li>■ Access to beach lost when sea wall fails but possibility for relocation</li><li>■ Beach similar to present</li></ul>
	Long Term	Managed realignment – no defences	**	~	✓✓	*	✓	=	=	*	*	=	✓	**	**	**	**	<ul style="list-style-type: none"><li>■ Further loss of over 190 residential properties at Ostend</li><li>■ Further loss of up to 10 commercial properties</li><li>■ Loss of most of the caravan parks at Bacton</li><li>■ Further loss of residential and holiday properties at Ostend</li><li>■ B 1159 at Walcott lost but alternative emergency route possible</li><li>■ Access to beach lost but possibility for relocation</li><li>■ Beach similar to present</li><li>■ Potential impact on the Broads SAC/SPA and the Broadland Ramsar as a result of saline intrusion into the Ant caused by coastal erosion.</li></ul>
NAI scenario for policy unit 6.12 – Ostend to Eccles																		
The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same as those shown below.																		
6.12 – Ostend to Eccles	Short term	No active intervention – Timber revetment and groynes allowed to fail	✓	~	~	*	~	=	=	=	~	=	~	*	*	*	**	<ul style="list-style-type: none"><li>■ Loss of some seafront houses along Beach Road in Happisburgh (less than 15)</li><li>■ Loss of caravan park at Happisburgh</li><li>■ No loss of listed buildings but loss of seafront land at Happisburgh</li><li>■ Loss of farmland</li><li>■ Continued erosion will allow exposure of geology benefitting the cliffs designated as SSSI</li><li>■ Access to the beach likely to be difficult</li><li>■ Loss of HM Coastguard Rescue facility building and no access</li><li>■ No lifeboat access</li><li>■ Small beach present in retreated position</li></ul>
	Medium term	No active intervention – No defences	✓	~	✓✓	*	✓	=	=	=	*	*	✓	*	*	**	**	<ul style="list-style-type: none"><li>■ Further loss of some seafront houses along Beach Road in Happisburgh (less than 10)</li><li>■ Listed buildings at high risk of erosion (Grade I St Mary’s Church and Grade II Manor House and Hill House Hotel )</li><li>■ Further loss of farmland</li><li>■ Continued erosion will allow exposure of geology benefitting the cliffs designated as SSSI</li><li>■ No access to the beach</li><li>■ Loss of HM Coastguard Rescue facility building</li><li>■ No lifeboat access</li><li>■ Beach present but access issues</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics														Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population		Human Health
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries		Physical and mental wellbeing
	Long Term	No active intervention – No defences	✓	~	✓✓	✖	✓	=	=	=	✖	✖✖	✓	✖✖	✖	✖✖	✖✖	<ul style="list-style-type: none"><li>■ Further loss of some seafront houses along Beach Road in Happisburgh (less than 15)</li><li>■ Loss of Listed buildings (Grade I St Mary’s Church and Grade II Manor House and Hill House Hotel )</li><li>■ Further loss of farmland</li><li>■ Continued erosion will allow exposure of geology benefitting the cliffs designated as SSSI</li><li>■ No access to the beach</li><li>■ No lifeboat access</li><li>■ Beach present but access issues</li></ul>
6.13 – Eccles to Winterton Beach Road	<b>NAI scenario for policy unit 6.13 – Eccles to Winterton Beach Road</b> If the preferred polices where not implemented for this unit the seawall and reefs at Sea Palling will remain, in the short term however the seawall to the south may fail together with the old groynes. This would result in a potential reduction in the Winterton Dune area due to natural fluctuations and reduced sediment feed. In the medium term the reefs and seawall will remain along Sea Palling, however the groynes to the south will fail during the beginning of this period. This would result in a high risk of loss of the car parks at Sea Palling and Horsey Gap due to breach of the defences and subsequent flooding. There will also be high risk of damage to residential properties and community facilities at Waxham and a Grade I listed building at Waxham Barn due to uncontrolled flooding. Dune erosion at Winterton Dunes is likely due to beaching to the north and uncontrolled flooding may be detrimental to the AONB. In the long term there will be no defences to the south but the reefs will probably remain in place this would result in the loss of the Bush Estate at Eccles, car parks at Cart Gap, car parks at Sea Palling and Horsey Gap, damage to and loss of properties, community facilities at Waxham due to flooding, erosion of Winterton Dunes and detrimental impacts on the AONB due to uncontrolled flooding.																	
	Short term	Hold the existing line – Offshore reefs and seawall maintained, groynes replaced and continued beach recharge. Possible construction of flood embankment just behind dune belt at Winterton (in event of seawall breach) and dune management.	~	~	✖	~	~	✖	✖	~	✓	=	✓	✖	~	~	~	<ul style="list-style-type: none"><li>■ No loss of the Bush Estate Eccles, car parks at Cart Gap, Car parks at Sea Palling and Horsey Gap, residential and commercial properties at Sea Palling, infrastructure at Sea Palling, Sea Palling IRB station, residential properties at Waxham, community facilities at Waxham and Waxham Barn.</li><li>■ No loss of dunes behind the seawall and reefs, together with recharge will help maintain a beach and embryo dunes in front.</li><li>■ No change to beach access</li><li>■ Beach present (with recharge)</li><li>■ Potential loss of dune area at Winterton Dunes and Ness due to ness fluctuation but sediment supply via recharge.</li><li>■ No loss to residential properties at Winterton (north of Beach Road) as protection provided by natural dune defence</li><li>■ Negative impact on the AONB associated with the impacts on the SAC/SSSI which form part of its quality.</li><li>■ Positive impacts on the AONB associated with the protection of properties which are part of the character of the AONB.</li></ul>



Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health	
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing	
	Medium term	Hold the existing line – Offshore reefs maintained, seawall maintained throughout frontage, groynes replaced and continued recharge. Flood embankment maintained at Winterton (if required) and dune management	~	~	*	~	~	*	*	*	✓	=	✓	*	~	~	~	✓ <ul style="list-style-type: none"><li>■ No loss of the Bush Estate Eccles, car parks at Cart Gap, Car parks at Sea Palling and Horsey Gap, residential and commercial properties at Sea Palling, infrastructure at Sea Palling, Sea Palling IRB station, residential properties at Waxham, community facilities at Waxham and Waxham Barn.</li><li>■ No loss of dunes behind the seawall and reefs, together with recharge will help maintain a beach and embryo dunes in front.</li><li>■ No change to beach access</li><li>■ Beach present (with recharge)</li><li>■ Potential loss of dune area at Winterton Dunes and Ness due to ness fluctuation but sediment supply via recharge.</li><li>■ No loss to residential properties at Winterton (north of Beach Road) as protection provided by natural dune defence</li><li>■ Negative impact on the AONB associated with the impacts on the SAC/SSSI which form part of its quality.</li><li>■ Positive impacts on the AONB associated with the protection of properties which are part of the character of the AONB.</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health	
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing	
	Long Term (a)	Hold the existing line – Retired defence line constructed (3 possible location options to be considered) and reefs, seawall and groynes allowed to deteriorate and fail	~	~	*	~	~	*	*	*	✓	=	✓	*	~	~	~	✓ <ul style="list-style-type: none"><li>■ No loss of the Bush Estate Eccles, car parks at Cart Gap, Car parks at Sea Palling and Horsey Gap, residential and commercial properties at Sea Palling, infrastructure at Sea Palling, Sea Palling IRB station, residential properties at Waxham, community facilities at Waxham and Waxham Barn.</li><li>■ No loss of dunes behind the seawall and reefs, together with recharge will help maintain a beach and embryo dunes in front.</li><li>■ No change to beach access</li><li>■ Beach present (with recharge)</li><li>■ Potential loss of dune area at Winterton Dunes and Ness due to ness fluctuation but sediment supply via recharge.</li><li>■ No loss to residential properties at Winterton (north of Beach Road) as protection provided by natural dune defence</li><li>■ Negative impact on the AONB associated with the impacts on the SAC/SSSI which form part of its quality.</li><li>■ Positive impacts on the AONB associated with the protection of properties which are part of the character of the AONB.</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health	
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing	
6.13 – Eccles to Winterton Beach Road	Long Term (b)	Managed Realignment -- If holding the line becomes technically and economically sustainable then the policy option in the long term will become managed realignment.	**	**	=	=	**	=	=	=	**	**	✓	*	**	**	**	<div><ul style="list-style-type: none"><li>■ Loss of residential properties (including the villages of Hickling, Horsey, Potter Herigham, West Somerton).</li><li>■ Loss of commercial properties in the above villages</li><li>■ Complete change to the Broadland habitat.</li><li>■ Loss of agricultural land</li><li>■ Loss of tourist related property and facilities</li><li>■ Loss of historic buildings including windmills and heritage sites</li><li>■ Loss of infrastructure including roads</li><li>■ Loss of the B1159 coast road.</li><li>■ Loss / partial loss of the Bush Estate Eccles under three scenarios</li><li>■ Loss of car parks at Cart Gap under three scenarios</li><li>■ Loss of car parks at Sea Palling and Horsey Gap</li><li>■ Potential recreation of beach dune system at Marram Hills CWS and Wrxham Sands Holiday park CWS in retreated position, but net loss of dune volume expected</li><li>■ Present access to the beach lost but possible relocation</li><li>■ Residential properties at Sea Palling lost under retired lines 2 and 3 (possibly retained under retired line 1)</li><li>■ Commercial properties at Sea Palling lost under retired lines 2 and 3 (possibly retained under retired line 1)</li><li>■ Infrastructure at Sea Palling lost under retired lines 2 and 3 (possibly retained under retired line 1)</li><li>■ Sea Palling IRB station loss under 3 scenarios</li><li>■ Beach and foreshore los under 3 scenarios, potential for beach in a retreated position, but different form to present</li><li>■ Residential properties at Waxham lost under 3 scenarios</li><li>■ Community facilities at Waxham lost under 3 scenarios</li><li>■ Waxham Barn Grade 1 listed building lost under 3 scenarios</li><li>■ High risk of breach and erosion of Winterton Dunes and Ness</li><li>■ No loss to residential properties at Winterton (north of Beach Road) as protection provided by natural dune defence</li><li>■ Once retired line option constructed a more naturally functioning coast will develop benefitting the AONB, however the loss of properties will also have a native impact on the character of the AONB.</li></ul></div>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics														Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population		Human Health
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries		Physical and mental wellbeing
6.14 – Winterton-on-Sea (South of Beach Road) to Scratby	NAI scenario for policy unit 6.14 – Eccles to Winterton-on-Sea (South of Beach Road) to Scratby																	
	The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same as those shown below.																	
	Short term	No active intervention – No shoreline defences	*	*	~	*	~	=	=	=	*	=	~	*	*	~	*	<ul style="list-style-type: none"><li>■ No loss of residential properties at Winterton, protection provided by natural dune defence</li><li>■ Loss of up to 5 properties and associated infrastructure at Hemsby and Scatby</li><li>■ No loss of Winterton Valley Estate as protection provided by natural dune defence</li><li>■ No loss of the holiday development at Hemsby</li><li>■ No loss of recreation and tourist facilities at Winterton as protection provided by natural defence</li><li>■ No loss of tourism related property and facilities at Hemsby and Scatby</li><li>■ No change from present to the County Wildlife Site</li><li>■ No loss to the community facilities at Winterton as protection provided by the natural dune defence</li><li>■ No loss to the community facilities at Hemsby and Scatby</li><li>■ No loss to infrastructure at Winterton</li><li>■ No loss to the submarine telecommunications cables but possible damage due to erosion.</li><li>■ Some losses of infrastructure at Hemsby and Scatby related to the holiday village</li><li>■ Loss of some access roads at Hemsby and Scratby</li><li>■ Erosion of Hemsby Marrams dunes will continue</li><li>■ Beach present</li><li>■ Access to beach still possible</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics														Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population		Human Health
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries		Physical and mental wellbeing
	Medium term	No active intervention – No defences	*	*	~	*	✓	=	=	=	*	=	~	**	**	*	**	<ul style="list-style-type: none"><li>■ No loss of residential properties at Winterton, protection provided by natural dune defence</li><li>■ Most seaward properties at Hemsby and Scratby up to 60 properties lost</li><li>■ No loss of Winterton Valley Estate as protection provided by natural dune defence</li><li>■ Some loss of seafront holiday development at Hemsby</li><li>■ No loss of recreation and tourist facilities at Winterton as protection provided by natural defence</li><li>■ Some loss of tourism related property and facilities at Hemsby and Scratby</li><li>■ County Wildlife Site probably lost</li><li>■ No loss to the community facilities at Winterton as protection provided by the natural dune defence</li><li>■ Some loss to the community facilities at Hemsby and Scatby</li><li>■ No loss to infrastructure at Winterton</li><li>■ No loss to the submarine telecommunications cables but possible damage due to erosion</li><li>■ Some losses of infrastructure at Hemsby and Scatby related to the holiday village</li><li>■ Loss of some linkage roads at Hemsby and Scratby</li><li>■ Possible loss of Hemsby Marrams Dunes</li><li>■ Beaches likely to be similar to today</li><li>■ Possible loss of access to the beach due to dune erosion but provision of alternative</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics														Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population		Human Health
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries		Physical and mental wellbeing
	Long Term	No active intervention – No defences	**	**	~	*	✓	=	=	=	*	=	~	**	**	**	**	<ul style="list-style-type: none"><li>■ No loss of residential properties at Winterton, protection provided by natural dune defence</li><li>■ Further 100 properties lost at Hemsby and Scratby</li><li>■ Low risk of loss of Winterton Valley Estate as protection provided by natural dune defence</li><li>■ Further loss of seafront holiday development at Hemsby</li><li>■ No loss of recreation and tourist facilities at Winterton as protection provided by natural defence</li><li>■ Further loss of tourism related property and facilities at Hemsby and Scratby</li><li>■ County Wildlife Site lost</li><li>■ No loss to the community facilities at Winterton as protection provided by the natural dune defence</li><li>■ Further loss to the community facilities at Hemsby and Scatby</li><li>■ No loss to infrastructure at Winterton</li><li>■ No loss to the submarine telecommunications cables but possible damage due to erosion</li><li>■ Further losses of infrastructure at Hemsby and Scatby related to the holiday village</li><li>■ Further loss of some linkage roads at Hemsby and Scratby</li><li>■ Loss of Hemsby Marrams dunes and potential reactivation of sand cliffs</li><li>■ Beaches likely to be similar to today</li><li>■ Possible loss of access to the beach due to dune erosion but provision of alternative</li></ul>
6.15 California to Caister-on-Sea	NAI scenario for policy unit 6.15 – California to Caister-on-Sea																	
	If the policies where not to be implemented the rock bund would remain in place in the short term and much of the medium term, however by the long term there will be no defences present. The impact of implementing the hold the existing line policy in the short term and managed realignment in the medium and long term will not reduce the impacts from the NAI scenario, however they will be delayed to enable measures to be put in place to manage the realignment. Therefore the impacts of the NIA scenario will be similar to those that are shown below, however the impacts on property loss in the medium term could potentially by more pronounced under NIA due to failure of the rock bund during this period.																	
	Short term	Hold the existing line – Rock bund maintained	*	*	~	~	~	*	*	*	✓	=	~	*	*	~	*	<ul style="list-style-type: none"><li>■ Loss of less than 5 seafront properties at California</li><li>■ Some land at the holiday development at California lost but not main sites</li><li>■ Recreational and tourist facilities should not be effected</li><li>■ Minimum loss of County Wildlife Site</li><li>■ No loss to infrastructure</li><li>■ Potential loss to the road between Scratby and California</li><li>■ Beach present</li><li>■ Access to beach at California Gap maintained</li></ul>

## 6.16 – Caister-on-Sea

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics														Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population		Human Health
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries		Physical and mental wellbeing
	Short term	Hold the existing line – Seawall, reefs and groynes maintained	~	*	~	~	~	*	*	*	✓	=	~	~	~	~	✓	<ul style="list-style-type: none"><li>■ No loss to residential facilities, community facilities, recreational and tourist facilities and the seafront holiday centre and caravan parks at Caister</li><li>■ Minimum loss of Caister Point County Wildlife Site</li><li>■ Natural fluctuations of dunes but no loss expected to the buildings or access to Caister Volunteer Rescue Service</li><li>■ Beach present</li><li>■ Beach access will remain</li><li>■ No loss to tourist and recreational facilities</li><li>■ No loss to the Caravan parks at North Denes</li><li>■ No loss to Great Yarmouth and Caister Golf Club</li><li>■ No loss of Great Yarmouth Race Course</li><li>■ No loss to infrastructure</li><li>■ Beach present</li><li>■ No loss to heritage sites</li><li>■ No loss to beach access</li><li>■ Deterioration of dunes and beach loss at the southern end</li></ul>
	Medium term	Hold the existing line – Seawall, reefs and groynes maintained	*	*	*	~	~	*	*	*	✓	=	*	~	~	~	✓	<ul style="list-style-type: none"><li>■ No loss to residential facilities, community facilities, recreational and tourist facilities and the seafront holiday centre and caravan parks at Caister</li><li>■ Some loss to the northern end of Caister Point County Wildlife Site but integrity of the site maintained</li><li>■ Natural fluctuations of dunes but no loss expected to the buildings or access to Caister Volunteer Rescue Service</li><li>■ Beach present</li><li>■ Beach access will remain</li><li>■ No loss to tourist and recreational facilities</li><li>■ No loss to the Caravan parks at North Denes</li><li>■ No loss to Great Yarmouth and Caister Golf Club</li><li>■ No loss of Great Yarmouth Race Course</li><li>■ No loss to infrastructure</li><li>■ Beach present no disturbance from defence works. Beach steepening may result in loss of areas for tern nesting – impact on SPA designation</li><li>■ No loss to heritage sites</li><li>■ No loss to beach access</li><li>■ Further deterioration of dunes and beach loss at the southern end</li><li>■ Beach present although narrower</li></ul>



Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics														Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population		Human Health
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries		Physical and mental wellbeing
	Long Term	Managed realignment – Seawall, reefs and groynes allowed to deteriorate	xx	xx	✓	x	✓	=	=	x	x	=	✓	xx	xx	xx	xx	<ul style="list-style-type: none"><li>■ Loss of up to 50 properties at northern end of frontage</li><li>■ Loss of some community facilities properties but not in the main part of the town.</li><li>■ Recreational and tourist facilities area of uncertainty due to fluctuations of ness feature. High risk of dune erosion should the wall be exposed and fail.</li><li>■ Loss of a number of caravan parks at Caister</li><li>■ Loss of Caister Point County Wildlife Site likely</li><li>■ Natural fluctuations of dunes but no loss expected to the buildings or access to Caister Volunteer Rescue Service</li><li>■ Beach present although initially more narrow once reefs and groynes reduce in trapping efficiency</li><li>■ No loss to recreational and tourist facilities but increased risk of over topping for properties on promenade at southern end of frontage.</li><li>■ No loss to the Caravan parks at North Denes</li><li>■ No loss to Great Yarmouth and Caister Golf Club</li><li>■ No loss of Great Yarmouth Race Course</li><li>■ No loss to infrastructure</li><li>■ Beach present but narrower along northern end. Subject to natural fluctuations but input of sediment from allowing defences to fail further north – any beach steeping may result in loss of areas for tern nesting. Possible impact on constructing flood defence.</li><li>■ No loss to heritage sites</li><li>■ No loss to beach access</li><li>■ Loss of beach along the southern section and narrowing along the northern section.</li><li>■ Beach present along most of the frontage but narrower at northern end.</li></ul>
6.17 – Great Yarmouth	NAI scenario for policy unit 6.17 –Great Yarmouth																	
	If the NAI were implemented at Great Yarmouth, the seawall and groynes will remain in place in the short term and the harbour arm will remain as a port structure. As the defences will still be in place over this timeframe the impacts will be the same as those shown for the hold the existing line policy in the short term below. In the medium term the seawall and groynes will fail, the harbour arm will remain as a port structure. This would result in increased risk of erosion and flooding to seafront residential and commercial properties to the southern end of the frontage and the industrial units at South Denes. In the long term there will be no defences however, the harbour arm will still remain as part of the port structure, This will result in a high risk of erosion and flooding of residential and commercial properties at the southern end of the frontage and the industrial units at South Denes.																	
	Short term	Hold the existing line – Seawall, Harbour arm (and groynes maintained until redundant) maintained to prevent erosion	~	~	~	~	x	x	x	x	✓	=	~	~	✓	~	✓	<ul style="list-style-type: none"><li>■ No loss to residential and commercial properties, no loss to industrial units at South Denes</li><li>■ No issue with port operation with respect to defences.</li></ul>

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
	Medium term	Hold the existing line – Seawall Harbour arm (and groynes maintained until redundant) maintained to prevent erosion	*	✓	~	*	~	*	*	*	✓	=	*	~	✓	~	✓	<ul style="list-style-type: none"><li>■ No loss to residential and commercial properties, no loss to industrial units at South Denes</li><li>■ No issue with port operation with respect to defences.</li><li>■ Integrity of the North Denes SSSI maintained, possible losses to the SPA area on the seaward side due to system retreat</li></ul>	
	Long Term	Hold the existing line – Seawall and harbour arm maintained to prevent erosion	**	✓✓	~	*	~	*	*	*	✓	=	*	*	✓	*	*	✓	<ul style="list-style-type: none"><li>■ No loss of residential properties</li><li>■ No loss of commercial properties and industrial units at South Denes but increased risk of overtopping</li><li>■ No issue with port operation with respect to defences</li><li>■ Integrity of the North Denes SSSI maintained, possible losses to the SPA area on the seaward side due to system retreat</li></ul>
<b>6.18 – Gorleston</b> <b>NAI scenario for policy unit 6.18 –Gorleston</b> If the policies are not implemented at Gorleston the seawall will remain in the short term, however the groynes will fail during this period. The harbour arm will also remain in place as part of the harbour structure as a consequence under NAI the impacts will be the same as those identified for the hold the line policy in the short term. In the medium term the seawall will fail, through the harbour arm will remain in place. This will result in the loss of over 250 residential properties, over 30 commercial properties close to the pier, loss of some community and recreational and tourist facilities and loss of services associated with property loss. In the long term, the harbour arm is expected to remain, however there will be a further loss of over 150 properties, over 10 commercial properties, loss of the pavilion, loss of community and recreational and tourist facilities and further loss of services associated with property loss.																			
	Short term	Hold the existing line – Seawall, harbour arm and reefs maintained with recharge, to prevent erosion	~	~	~	~	~	*	*	~	✓	=	~	~	✓	~	✓	<ul style="list-style-type: none"><li>■ No issue with port operation with respect to defences</li><li>■ No loss of residential or commercial properties, Gorleston Pavilion and other heritage sites, community facilities recreational and tourist facilities and infrastructure</li><li>■ Beach present and maintained through recharge</li></ul>	
	Medium term	Hold the existing line – Seawall, harbour arm and reefs maintained to prevent erosion	~	~	*	~	*	*	*	*	✓	=	*	~	✓	~	✓	<ul style="list-style-type: none"><li>■ No issue with port operation with respect to defences</li><li>■ No loss of residential or commercial properties, Gorleston Pavilion and other heritage sites, community facilities and infrastructure</li><li>■ No loss of recreational and tourist facilities and reefs help to maintain beaches</li><li>■ Beach present but may narrow along the southern section</li></ul>	

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
	Long Term	Hold the existing line – Seawall, harbour arm and reefs maintained to prevent erosion	~	~	*	~	*	*	*	*	✓	=	*	*	✓	*	*	✓	<ul style="list-style-type: none"><li>■ No issue with port operation with respect to defences</li><li>■ No loss of residential or commercial properties, Gorleston Pavilion and other heritage sites and community facilities</li><li>■ No loss of recreational and tourist facilities and reefs help to maintain beaches</li><li>■ No loss to infrastructure but pumping station may require works to maintain outlet to the sea</li><li>■ Narrower beach, particularly along the southern section</li></ul>
6.19 – Gorleston to Hopton	NAI scenario for policy unit 6.19 – Gorleston to Hopton The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same as those shown below.																		
	Short term	No active intervention – Timber revetment and groyne maintained until failure	~	~	~	~	~	=	=	=	~	=	~	~	~	*	*	<ul style="list-style-type: none"><li>■ Loss to Gorleston Golf Course land including some holes.</li></ul>	
	Medium term	No active intervention – Timber revetment and groyne allowed to deteriorate and fail	~	~	✓	~	✓	=	=	=	*	=	✓	~	*	*	*	<ul style="list-style-type: none"><li>■ Further loss of Gorleston Golf Course land</li></ul>	
	Long Term	No active intervention – No defences	~	~	✓✓	~	✓	=	=	=	*	=	✓	~	*	*	*	<ul style="list-style-type: none"><li>■ Further loss of Gorleston Golf Course land</li></ul>	
6.20 – Hopton	NAI scenario for policy unit 6.20 – Hopton If the policy is not implemented along this stretch the seawall will start to fail by the end of the short term and there will be no defences in the medium and long term. The impact of implementing the hold the existing line policy in the short term and no active intervention in the medium and long term will not reduce the impacts from the NAI scenario, however they will be delayed to enable measures to be put in place to manage the realignment. Therefore the impacts of the NIA scenario will be similar to those that are shown below.																		
	Short term	Hold the existing line – Timber revetment and groyne to the north maintained until failure. Seawall and groyne maintained	~	~	*	*	*	*	*	*	✓	=	~	~	*	*	*	<ul style="list-style-type: none"><li>■ No loss of residential or commercial properties, community facilities and recreational and tourist facilities</li><li>■ Loss of seafront Hopton Holiday Village accommodation</li><li>■ Loss of services associated with non-holiday village properties</li><li>■ Beach access maintained but loss of temporary informal access</li><li>■ Beach present but narrower</li></ul>	

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health		
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing		
	Medium term	No active intervention – Timber revetment, seawall and groynes allowed to deteriorate and fail	~	~	✓	✖	✓	=	=	=	✖	=	✓	✖	✖✖	✖✖	✖✖	<ul style="list-style-type: none"><li>■ Loss of less than 5 seafront houses along Beach Road once sea wall fails</li><li>■ No loss of non-tourist facilities</li><li>■ No loss to the heart of village, not affected by erosion</li><li>■ Loss of seafront Hopton Holiday Village accommodation</li><li>■ Loss of recreational and tourist facilities associated with the Holiday Village and playing field and miniature golf course lost to south.</li><li>■ Loss of services, associated with housing, and promenade lost</li><li>■ Beach access lost</li><li>■ Beach present in retreated position once defences have failed</li></ul>	
	Long Term	No active intervention – No defences	~	~	✓✓	✖	✓	=	=	=	✖	=	✓	✖✖	✖✖	✖✖	✖✖	<ul style="list-style-type: none"><li>■ Further loss of less than 10 seafront houses in Beach Road area</li><li>■ No loss of non-tourist facilities</li><li>■ No loss of heart of village, not effected by erosion</li><li>■ Loss of seafront Hopton Village seafront accommodation</li><li>■ Further loss of recreational and tourist facilities along the coastal strip.</li><li>■ Further loss of services associated with housing</li><li>■ No access to the beach</li><li>■ Beach present but possible access problems</li></ul>	
6.21 – Hopton to Corton	NAI scenario for policy unit 6.21 – Hopton to Corton																		
	The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same as those shown below.																		
	Short term	No active intervention – Timber revetment and groynes allowed to fail	~	~	~	~	~	=	=	=	~	=	~	~	~	✖	✖	<ul style="list-style-type: none"><li>■ No loss to Broadland Sands (despite cliff retreat)</li><li>■ Loss of farmland</li><li>■ Beach present</li><li>■ Informal access lost to beach at Broadland Sands</li><li>■ No loss to the pumping station</li></ul>	
	Medium term	No active intervention – No defences	~	~	✓✓	~	✓	=	=	=	✖	=	✓	✖	~	~	✖✖	✖	<ul style="list-style-type: none"><li>■ Some loss to Broadland Sands Holiday Centre at the edge of the site</li><li>■ Loss of farmland</li><li>■ Beach present but possible access issues</li><li>■ Access to beach at Broadland Sands lost</li><li>■ Expose of the MOD bunker</li><li>■ No loss to the pumping station</li></ul>
	Long Term	No active intervention – No defences	~	~	✓✓	✖	✓	=	=	=	✖	=	✓	✖	~	✖	✖✖	✖✖	<ul style="list-style-type: none"><li>■ Loss of caravan pitches but not main resort buildings</li><li>■ Loss of farmland</li><li>■ Beach present but possible access issues</li><li>■ No access to the beach at Broadland Sands</li><li>■ Increased exposure of the MOD bunker</li><li>■ Loss of part of the pumping station site</li></ul>
6.22 – Corton	NAI scenario for policy unit 6.22 – Corton																		
	If the policy is not implemented at Corton in the seawall and rock revetment will remain during the short term and fail during the start of the medium term, therefore there would be no defences present in the long term. The impact of implementing the hold the existing line policy in the short term and managed realignment in the medium and long term will not reduce the impacts from the NAI scenario, however they will be delayed occurring at a slightly later stage than if there were NAI enabling measures to be put in place to manage the realignment. Therefore the impacts of the NIA scenario will be similar to those that are shown below																		

**NAI scenario for policy unit 6.23 – Corton to Lowestoft**

The policy for this unit at all three timeframes is no active intervention therefore the effects will be the same as those shown below.

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics														Comments	
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population		Human Health
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorp-hology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries		Physical and mental wellbeing
	Short term	No active intervention – Timber groyne allowed to fail	*	*	~	*	~	=	=	=	=	~	~	*	*	~	<ul style="list-style-type: none"><li>■ Possible damage to pipelines through erosion</li><li>■ Deterioration and loss of dunes likely, so some loss of County Wildlife Sites at Gunton Warren</li><li>■ Loss of open space through erosion</li><li>■ Beach present</li><li>■ Risk of old dump exposure</li><li>■ Access possible to the beach at Tramps Alley</li></ul>	
	Medium term	No active intervention – No defences	**	**	✓✓	*	✓	=	=	=	*	=	✓	~	*	*	*	<ul style="list-style-type: none"><li>■ Increased risk of damage to pipelines through erosion</li><li>■ Loss of dunes, so loss of County Wildlife Sites at Gunton Warren but naturally functioning system</li><li>■ Loss of open space through erosion</li><li>■ Beach present</li><li>■ High risk of old dump exposure as much of dunes will erode</li><li>■ Access to beach at Tramps Alley lost</li></ul>
	Long Term	No active intervention – No defences	**	**	✓✓	**	✓	=	=	=	*	=	✓	~	*	*	*	<ul style="list-style-type: none"><li>■ Damage to pipelines through erosion</li><li>■ Exposure of sand cliffs (possible habitat creation)</li><li>■ Further loss of open space through erosion</li><li>■ Beach present in retreated position</li><li>■ Much of dunes eroded therefore exposure of dump probably occurred in the medium term.</li><li>■ No access to the beach at Tramps Alley</li></ul>
6.24 – Lowestoft North (to Ness Point)	NAI scenario for policy unit 6.24 – Lowestoft North (to Ness Point)																	
	If the NAI scenario were adopted in the policy unit the seawall would remain throughout the short and medium timeframes but fail in the long term. Therefore the impacts in the short and medium timeframes will be the same as those presented below for the same timeframes. However, in the long term with the failure of the seawall in the long term it will result in the loss of properties, increased risk to infrastructure, loss of link roads, flood and erosion risk to the recreation ground and the promenade, loss of or damage to heritage sites and open space due to flooding, risk of exposure of a household waste tip and loss of Euroscope which marks the most easterly point in England.																	
	Short term	Hold the existing line – Seawall maintained to prevent erosion and flooding	~	~	*	~	*	*	*	*	✓	=	~	~	✓	~	✓	<ul style="list-style-type: none"><li>■ No loss of commercial properties, infrastructure, recreational and tourist facilities, Lowestoft North Denes and Lowestoft Ness point</li><li>■ Little/no beach particularly at southern end</li></ul>
Medium term	Hold the existing line – Seawall maintained to prevent erosion and flooding	~	~	*	~	*	*	*	*	✓	=	*	~	✓	*	✓	<ul style="list-style-type: none"><li>■ No loss of commercial properties, infrastructure and Lowestoft North Denes</li><li>■ No loss of recreational and tourist facilities but promenade more exposed to overtopping</li><li>■ No loss to Lowestoft Ness Point but increased works required</li><li>■ No beach</li></ul>	

Policy Unit	Timeframe	Policies to Implement the Plan	SEA Topics															Comments
			Biodiversity, Flora and Fauna		Soil	Water		Air	Noise	Climatic Factors		Archaeology and Heritage	Landscape		Material Assets	Population	Human Health	
			Protected Sites and Species	Ecosystems and biological diversity	Sediment, geology, and geomorphology	Water Quality	Coastal Flooding	Dust	Noise	Reducing CO <sub>2</sub> emissions	Adapting to changes in climate	Historic environment and archaeology	Natural landscape and seascape	Built landscape and townscape	Coastal material assets	Coastal activities and industries	Physical and mental wellbeing	
	Long Term	Hold the existing line – Seawall maintained to prevent erosion and flooding	~	~	xx	~	xx	x	x	x	✓	=	xx	x	✓	x	x	✓ <ul style="list-style-type: none"><li>■ No loss of commercial properties, infrastructure and Lowestoft North Denes</li><li>■ No loss of recreational and tourist facilities but promenade more exposed to overtopping</li><li>■ No loss to Lowestoft Ness Point but increased works required</li><li>■ No beach</li></ul>

