Kelling to Lowestoft Ness

Shoreline Management Plan

Adopted August 2012

NORTH NORFOLK DISTRICT COUNCIL

ENVIRONMENT AGENCY

GREAT YARMOUTH BOROUGH COUNCIL

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Prepared by: ..... Checked by: .....
Environmental Scientist Regional Director

With input from: Jan Brooke
Coastal policy advisor

Approved by:
Regional Director

Kelling Hard to Lowestoft Ness SMP

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AECOM House, 179 Moss Lane, Altrincham, Cheshire, WA15 8FH
Telephone: 0161 927 8200 Fax: 0161 927 8499 Website: http://www.aecom.com

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1 Introduction

1.1 THE SHORELINE MANAGEMENT PLAN

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

This 2009 document provides a number of updates to finalise the 2005 first revision to the original Sheringham to Lowestoft SMP (Halcrow, 1995/6). The purpose of this finalisation process has not been to radically alter policies proposed in the first review of the SMP, as these policies were developed in line with the appropriate guidance from Defra. However, the steering group for the finalisation of the SMP is aware of the sensitivity of some of the recommended policy options, as they affect people and communities in real terms. As such we have endeavoured to better explain how it is proposed that such implications might be mitigated, *inter alia* through measures designed to deliver 'social mitigation'. In particular the action plan has been expanded to identify key opportunities to minimise the anticipated effects on people and communities, of the recommended managed retreat or no active intervention policy options.

1.1.1 Guiding principles

The SMP is a non-statutory policy document for coastal defence management planning. As is the case for all SMPs, this plan has been prepared in line with appropriate Defra guidance (Defra 2006 'Shoreline Management Plan Guidance Volume 2: Procedures'). It takes account of other existing planning initiatives and legislative requirements, and is intended to inform wider strategic planning. However, it does not set policy for anything other than coastal defence management i.e. it does not provide detail as to how the social, economic or environmental consequences of the management policy would be dealt with. The latter is a matter for national Government policy makers. It is important to be clear that there is currently no mechanism for direct and total financial compensation for those affected by flooding or erosion. This is a matter for central Government policy. However there may be ways, at a more local level, to provide support in the form of partial, indirect or in-kind compensation to help those people affected to move away from areas at risk. In response to increased concerns, particularly about the social implications of managed realignment and no active intervention policies, and building upon work undertaken by Cardiff University[1], the Department of Food and Rural Affairs (Defra) has recently published a draft document[2] setting out suggestions as to how communities and individuals can be helped in the process of adapting to coastal change. This has led to the award of a number of 'Pathfinder' studies which aim to explore the ways in which communities can be helped and can help themselves, to adapt to coastal change.

[1] Marine and Coastal Environment (Mace) Research Group 2006 "adapting to Changing Coastlines and Rivers: Preliminary Report".

[2] Defra 2009 "Consultation on Coastal Change Policy"

The SMP promotes management policy options for a coastline into the 22nd century that achieve long-term objectives without committing to unsustainable defence. It is recognised that present-day objectives and acceptance mean that wholesale changes to existing management practices may not be appropriate in the very short term. The SMP thus provides a timeline for objectives, policy and management changes; i.e. a 'route map' for decision makers to move from the present situation towards the future.

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

The original SMP for this area (Cell 6.) was one of the first to be completed in England or Wales. Since that time many lessons have been learned. Reviews funded by Defra (2000, 2005) have examined the strengths and weaknesses of various plans and revised guidance has been issued. Some of this guidance is targeted at achieving greater consistency in the assessments and presentation of these plans, but there are more fundamental issues that have been identified, which this and other SMPs must address.

The policies set in an SMP are based on a strategic level of assessment and at this level they are considered to be the most appropriate options to take forward. However, it is possible that when they are subjected to the next tier of assessment – the Coastal Strategy Study – the policies may be found to be more difficult to deliver for physical, social, economic or environmental reasons. This is particularly important, as the action plan contained within this plan requires coastal strategies to take account of a very broad range of factors, including social mitigation and the local economy. For this reason it is important to understand that the policies presented are really policy 'aims' that are subject to confirmation within strategies. It is important, however, that other plans and policies, especially the relevant Local Development Framework documents, are compatible with the assessment of coastal risks, and the preferred policy options, identified in the SMP. The result of this approach should be that over time, land use and development decisions etc will help towards making the policy options deliverable when assessed in future SMP reviews, in particular where the deliverability of the policy option was constrained by social, financial and ecological factors. Equally, whilst selection of the policy options within the Plan has considered the affordability of each policy option, 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 policy options.

The SMP must also remain flexible enough to adapt to changes in legislation, politics and social attitudes. The Plan therefore considers objectives, policy setting and management requirements for three main epochs; 'from the present day', 'medium-term' and 'long-term', corresponding broadly to time periods of 0 to 20 years, 20 to 50 years and 50 to 100 years respectively. There is a need to have a long-term sustainable vision, which may change with time, but should be used to demonstrate that

defence decisions made today are not detrimental to achievement of that vision or any amended vision that results from changed attitudes and approaches to coastal management (ie. adaptive management is important). Considerable care is therefore needed when determining policy options.

1.1.2 Objectives

The objectives of the 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 policy options for managing those risks
- to identify the consequences of implementing these policy options
- to set out procedures for monitoring the effectiveness of the SMP policy options
- to identify areas that the SMP cannot address when following current guidelines.
- to inform others so that future land use and development of the shoreline can take due account of the risks and SMP policy options
- to comply with international and national nature conservation legislation and biodiversity obligations.

1.1.3 The SMP Policy options

The generic shoreline management policies considered are those defined by Defra, they 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. Included in this policy are 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. Use of 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) or to make safe defunct defences.
- **No active intervention,** where there is no investment in coastal defences or operations**.**

Note: in accordance with the Defra guidance, all the above policies are specifically related to shoreline management in terms of erosion and flooding. They do not provide detail as to how the social, economic or environmental consequences of the management policy would be dealt with. However, it is recognised that there are important human issues associated with policies such as managed realignment and no active intervention, even where this has been the policy previously. We have therefore endeavoured to identify and recommend the types of investigation that will need to be undertaken before the long term policy option can be implemented. These recommendations are carried through from the policy text to the Action Plan at the rear of this document. Further, all policy

decisions will need to be supported by strategic monitoring and must, when implemented, take due account of existing Health and Safety legislation.

1.2 STRUCTURE OF THE SMP

The overall Plan and associated policy options presented in this SMP are the result of numerous studies and assessments performed over a period of time. To provide clarity for different readerships, the documentation to communicate and support the Plan is provided in a number of parts. At the broadest level, these are divided into three; a non-technical summary, the Shoreline Management Plan itself, and a series of supporting appendices.

1.2.1 The Non-Technical Summary

This is a brief document which provides a summary of the key findings of the main study, in non-technical language and aimed at a widest readership. Detail is not presented as this is provided in the Shoreline Management Plan.

1.2.2 The Shoreline Management Plan

This document provides the Plan for the future and the policy options required for it to be implemented. This is intended for general readership and is the main tool for communicating intentions. Whilst the justification for decisions is presented, it does not provide all of the information behind the recommendations, this being contained in other documents.

The Plan is presented in five parts:

Section 1 gives details on the principles, aims, structure and background to its development.

Section 2 provides details of how the SMP meets the requirements of a Strategic Environmental Assessment (SEA).

Section 3 presents the basis for development of the Plan, describing the concepts of sustainable policy and providing an understanding of the constraints and limitations on adopting certain policies.

Section 4 presents the Plan at high level for the SMP as a whole, discussing the rationale, implications, and requirements to manage change. The coastline is considered in four broad sections.

Section 5 provides a series of statements for each of the 24 coastal policy units that detail the location-specific policy options proposed to implement the Plan and the local implications of these policy options.

Section 6 provides an action plan with a programme for future activities which are required to progress the Plan between now and its next review in 5 to 10 years time.

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

1.2.3 SMP supporting documents

The accompanying documents provide all of the information required to support the Plan. This is to ensure that there is clarity in the decision-making process and that the rationale behind the policy options being promoted is both transparent and auditable.

This information is largely of a technical nature and is provided in nine Appendices and three accompanying reports. These are as follows:

A. SMP Development: This reports the history of development of the SMP, describing more fully the Plan and policy decision-making process. The remaining documents effectively provide appendices to this report.
B. Stakeholder Engagement: All communications from the stakeholder process will be provided here, together with information arising from the consultation process.
C. Baseline Process Understanding: Includes baseline process report, defence assessment, No Active Intervention (NAI) and With Present Management (WPM) assessments and summarises data used in assessments.
D. Thematic Studies: This report identifies and evaluates the environmental features (human, natural, historical and landscape) in terms of their significance and how these need to be accommodated by the SMP.
E. Issues and Objective Evaluation: Provides information on the issues and objectives identified as part of the Plan development, including appraisal of their importance.
F. Policy Development and Appraisal: Presents the consideration of generic policy options for each frontage, identifying possible acceptable policy options, and their combination into 'scenarios' for testing, together with the process assessment and objective appraisal for each scenario.
G. Preferred Policy option: Presents the policy assessment and appraisal of objective achievement for the resultant Plan.
H. Economic Appraisal: Presents the economic analysis undertaken in support of the Plan.
I. Sources of Data: All supporting information used to develop the SMP is referenced for future examination and retrieval.

- **AECOM 2010. Kelling to Lowestoft Ness Shoreline Management Plan: Strategic Environmental Assessment Report – Volume 1 – 3**

An Environmental Report (ER) was produced as part the Strategic Environmental Assessment (SEA) of the Kelling to Lowestoft Ness Shoreline Management Plan (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 by certain plans and programmes that are required by legislative, regulatory or administrative provisions. The Directive is intended to ensure that environmental considerations (both good and bad) are taken into account alongside other economic and social considerations in the development of relevant plans and programmes. Whilst it has been determined that 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, Defra has recommended that the SMPs comply with the requirements of the Directive.

The SEA process is systematic and identifies and assesses the likely significant environmental effects of a plan or programme and its alternatives. SEA is used to aid policy development and helps organisations, plan developers and authorities consider the effects of plans and programmes in a structured way to demonstrate that policy development has considered environmental and other effects.

- **AECOM 2010. Kelling to Lowestoft Ness Shoreline Management Plan Habitats Regulations Assessment HR01 &HR02**

Appropriate Assessment is a requirement for certain developments within or in close proximity to sites designated for the international importance of their habitats and/or species. The requirement for such assessment stems from Regulation 48 of the Habitats Regulations (Amendment) 2007. It was considered that the plan would be likely to have a significant effect on the following sites: Winterton to Horsey Dunes SAC, Great Yarmouth North Denes SPA, The Broads SAC, Broadland SPA/Ramsar, and that the SMP was not directly connected with or necessary to the management of the above sites for nature conservation. Appropriate Assessment (Habitat Regulations Assessment) has therefore been undertaken of the implications of the proposal in view of the site's conservation objectives.

Natural England was consulted under Regulation 48(3) throughout the processes of the HRA from 21st January 2009 to January 2010. The sites' nature conservation objectives were taken into account, including consideration of the citations for the sites and information supplied by Natural England. The likely effects of the proposal on the international nature conservation interests for which the sites were classified or designated are summarised in the report.

The assessment has concluded that plan, as proposed, can be shown to have no adverse effect on the integrity of any of the sites.

- **AECOM 2010. Retrospective Assessment of the Kelling to Lowestoft Ness SMP against the Water Framework Directive**

The EU Water Framework Directive (WFD) which became law in England and Wales in 2003 introduces an integrated approach to the protection, management and monitoring of the water environment. England and Wales is divided up into a number of 'river basin districts' each of which contains many hundreds of 'water bodies'. The WFD sets new ecological and chemical objectives and it requires that all rivers, coasts, estuaries (referred to as transitional) and lake water bodies achieve a target referred to as 'good status' by 2015. However, in certain situations it may be possible to extend this deadline to 2021 or 2027, or even to set a less stringent target.

The SMP was assessed retrospectively to determine whether the policies it promotes might affect the ecological or chemical status of one or more of the relevant WFD water bodies. The status would be deemed to be affected under the WFD if a SMP policy would cause a deterioration in the WFD status

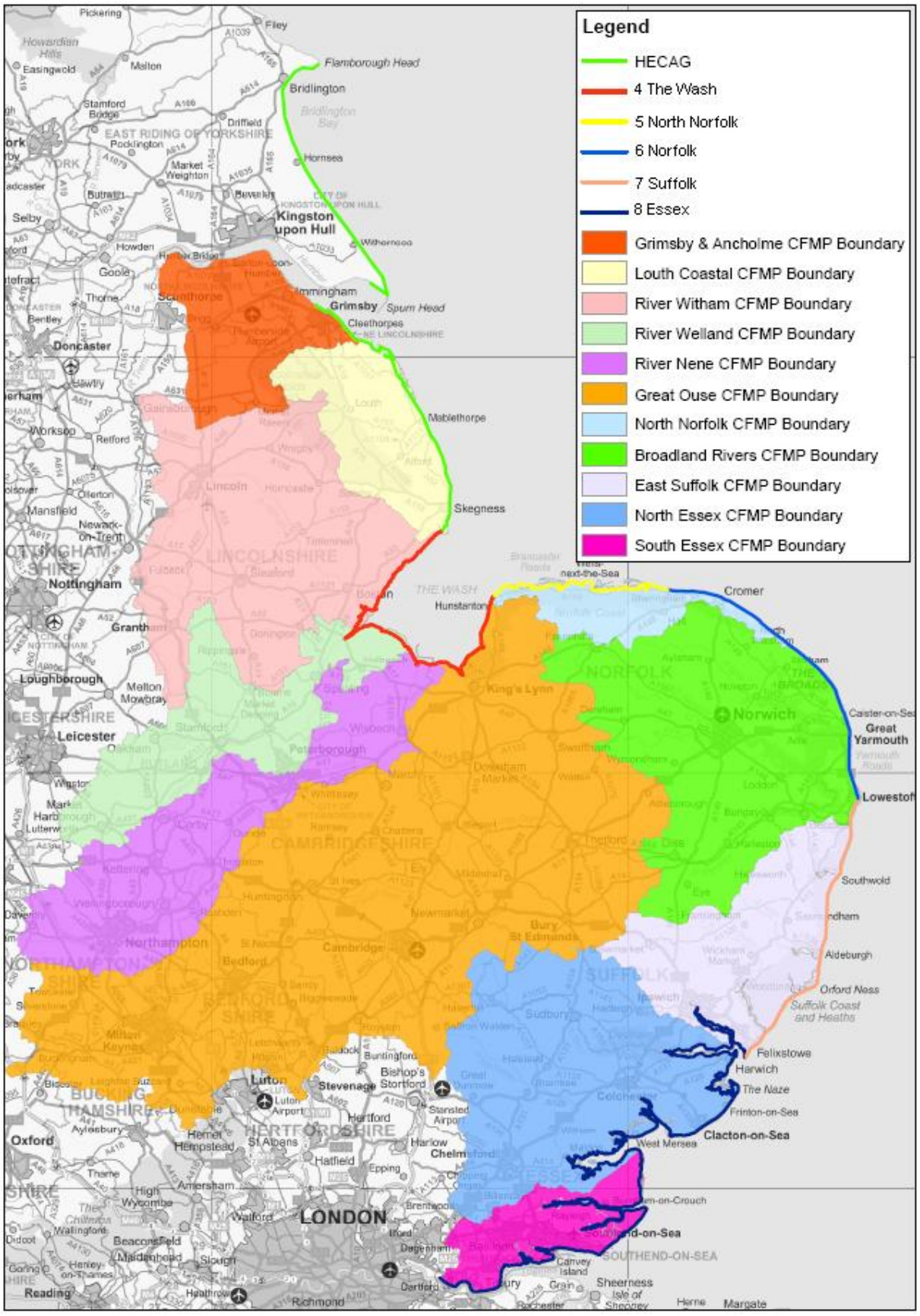
class of one or more of the WFD parameters at the level of the water body, or if it would prevent the water body from achieving its WFD objectives.

Overall, at water body level, SMP policies were considered to neither cause deterioration nor prevent the Norfolk East and Suffolk water bodies from reaching their WFD objectives. Indeed, in the longer term, the SMP policies were considered to be likely to support the WFD objectives in the Norfolk East coastal water body insofar as they aim towards a more natural coastline.

1.2.4 SMP Area

This SMP covers the length of coast between Kelling Hard in North Norfolk and Lowestoft Ness in Suffolk. This is shown as coastal plan 6 on Figure 1 and has been chosen as a section of shoreline which is largely self-contained with respect to coastal processes. There is very little alongshore sediment transport at the boundaries of this sub-cell, and therefore the policies in this SMP will not impact upon the coastlines covered by the neighbouring SMPs for North Norfolk and Suffolk.

Figure 1. The SMP Area



This SMP area forms the downstream limits of parts of the Environment Agency's North Norfolk and Broadland Rivers Catchment Flood Management Plans (CFMPs). These adopted CFMPs set out policies for managing flood risk from rivers, which in this area include the River Mun at Mundesley and the outfall of the River Yare in Great Yarmouth. The CFMPs have identified scope for reducing flood risk in both these towns, but the approaches to future flood risk management will not be affected by the policies in this SMP.

Along the Eccles to Winterton frontage, the risk of coastal flooding extends far into the Norfolk Broads area, with potentially serious social and environmental consequences. In reaching a policy decision for this unit, it has been recognised that it is important to ensure consistency with the relevant CFMP policy. The Broadland Rivers CFMP has a preferred policy for the tidally dominated Broads whereby the existing flood defences are maintained in the short term whilst investigations continue into the best approach for managing flood risk in the future.

1.3 THE PLAN DEVELOPMENT PROCESS

1.3.1 Revision of the SMP

The original SMP for Sheringham to Lowestoft was completed in 1996. Part of the SMP process is to regularly review and update the Plan, taking account of new information and knowledge gained in the interim. This is an updated version of the first revision to that Plan and has taken account of:

- 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)
- 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 legislation (e.g. the EU Directives)
- 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.)

Further revisions will be carried out every 5 to 10 years henceforth.

1.3.2 Production of the SMP

Development of this revision of the SMP has been led by a group including technical officers and representatives from North Norfolk District Council, Great Yarmouth Borough Council, Waveney District Council, the Environment Agency, Natural England, Defra and Great Yarmouth Port Authority.

The SMP process has involved over 30 stakeholders at key decision points, through formation of an Extended Steering Group (ESG), which has involved elected representatives and key players in coastal management (see Appendix B for further details on membership). Meetings with the ESG have been held to help to identify and understand the issues, review the objectives and set direction for appropriate management scenarios, and to review and comment upon the Plan and its policy options.

The SMP is based upon information gathered largely between January and August 2003 and provided by numerous parties contacted during this period. Many of the policies have since been updated and have been the subject of ongoing discussions with planners from each of the coastal authorities.

The main activities in producing the SMP have been:

- development and analysis of issues and objectives for various locations, assets and themes
- thematic reviews, reporting upon human, historic and natural environmental features and issues, evaluating these to determine relative importance of objectives
- analysis of coastal processes and coastal evolution for baseline cases of not defending and continuing to defend as at present
- agreement of objectives with the ESG, to determine possible policy scenarios
- development of policy scenarios which consider different approaches to future shoreline management, ranging from heavily defended to not defended
- examination of the coastal evolution in response to these scenarios and assessment of the implications for the human, historic and natural environment
- determination of the most appropriate Plan and policy options through review with the ESG, prior to compiling the SMP document
- consultation on the Plan and policy options
- consideration of responses to consultation and revision of the Plan where required
- finalisation of the Plan and associated policy options.
- Subsequent preparation of Strategic Environmental Assessment (SEA), Habitats Regulations Assessment and Water Framework compliance check
- Public consultation on SEA
- Finalisation of documents

1.3.3 Baseline Understanding of Coastal Behaviour

It is important that SMP policy options are based upon sound scientific information. There are two areas where some time has now elapsed since the preparation of Appendix C, but in both cases this is not considered prejudicial to the development of preferred policy options:

- Climate Change and Sea Level Rise – Climate change is an important driver in increasing flood risk and rates of coastal erosion. This SMP has used 2003 Defra sea level rise recommendations, which followed publication of the UKCIP02 report. Defra subsequently issued updated sea level rise guidance in 2006, and this is the guidance currently recommended for use in SMPs. For the period to 2040, the allowance for cumulative sea level rise assumed in developing the policy options in this SMP is close to the current Defra 2006 guidance. Beyond this the 2006 guidance suggests that greater allowances should be used. However, there remains considerable uncertainty over rates of sea level rise during the later epochs, and the approach adopted in this SMP has been to retain sufficient flexibility in the short term to allow modification in future SMP reviews as more information becomes available. The more recent Climate Change data (UK Climate Projections UKCP09) report has not at this stage prompted a further revision of the guidance but the implications of this will also need to be considered for the later epochs particularly.

- Coastal Processes – The assessments of shoreline dynamics contained in Appendix C build upon the Defra-funded Futurecoast (2002) project. Any known recent developments, such as construction of the Great Yarmouth Outer Harbour, have been addressed in the text of this report or the Action Plan. To date, Futurecoast remains the best source of evolution predictions for the coastline of England and Wales. Coastal erosion risk information that takes account of UKCP09 will be available over the next year and will need to be integrated into all the SMPs. The National Coastal Erosion Risk Mapping (NCERM) project team will produce a comparison report for each SMP to highlight whether there are any changes to the preferred policy options as a result of the more recent climate data being used. It will be necessary for the coastal group to consider the need for this information to be incorporated in this SMP, and appropriate activities to be identified in the updated Action Plan.

2 Environmental Assessment: meeting requirements of an SEA

2.1 BACKGROUND

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 by certain plans and programmes that are required by legislative, regulatory or administrative provisions. The Directive is intended to ensure that environmental considerations (both good and bad) are taken into account alongside other economic and social considerations in the development of relevant plans and programmes. Whilst it has been determined that SMPs are not required by legislative, regulatory or administrative provisions, they do set a framework for future development and have much in common with the kind of plans and programmes for which the Directive is designed. Therefore, Defra has recommended that the SMPs comply with the requirements of the Directive.

An SEA was conducted as part of the original SMP and integrated within it. Information contained within the original assessment and the subsequent studies that were carried out as part of the SMP process have been used and updated where necessary to produce a standalone Environmental Report which accompanies this plan.

This section identifies how the Draft Kelling to Lowestoft Ness SMP achieves the requirements of the 2004 Regulations. The text is sub-divided into sections representing the key requirements of the Regulations, and identifies the sections of the SMP documentation in which the relevant information is presented.

2.2 THE APPRAISAL PROCESS

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

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

2.3 STAKEHOLDER ENGAGEMENT

Greater involvement of Stakeholders in the appraisal process was encouraged through the formation of an Extended Steering Group (ESG) and through:

- involving stakeholders throughout its development and in particular the development of policy options, and
- giving the public the opportunity to comment on the choice and appraisal of options.

The ESG included representatives from interests including local authorities, nature conservation, industry and heritage. Elected Members have also been involved in reviewing the policy options prior to public consultation. In this way, the views of those whom the SMP policy options will affect are involved in its development, ensuring that all relevant issues are considered, and all interests represented.

Full details of all stages of stakeholder engagement undertaken during development of the draft Plan are presented in Appendix B and B(i).

2.4 THE EXISTING ENVIRONMENT

The coastline covered by this Plan has a rich diversity in its physical form, human usage and natural environment: including cliffs of both habitat and geological interest and low-lying plains fronted by dunes and beaches, characterised by a number of towns and villages along the coastal fringe interspersed by extensive areas of agricultural land. This combination of assets creates a coastline of great value, with a tourism economy of regional importance.

The current state of the environment is described in the 'Thematic Studies', presented in Appendix D. This identifies the key features of the natural and human environment of the coastline, including commentary on the characteristics, status, relevant designations, and commentary related to the importance of the features and the 'benefits' they provide to the wider community. The benefits assessment is provided in support of the definition of objectives.

In addition to the review of natural and human environment, the extent and nature of existing coastal defence structures and management practices are presented in Appendix C. This is supplemented by the 'Assessment of Shoreline Dynamics' baseline report, in Appendix C, which identifies the contemporary physical form of the coastline and the processes operating upon it.

2.5 ENVIRONMENTAL OBJECTIVES

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

The definition and appraisal of objectives has formed the focus of engagement with stakeholders during development of the SMP (as identified in Appendix B).

A Strategic Environmental Assessment Report has been prepared which details the process and findings of the Strategic Environmental Assessment (SEA) undertaken of the plan. The process includes consideration of how the objective, and hence the 'environment', would be affected under the 'No Active Intervention' scenario, also their achievement under the policy options considered feasible for that frontage, with consideration of international and national designations and obligations and biodiversity.

2.6 IDENTIFICATION AND REVIEW OF POSSIBLE POLICY SCENARIOS

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

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

2.7 ENVIRONMENTAL EFFECTS OF THE PLAN

Based upon the outputs from the testing of policy scenarios (2.6), the Plan has been defined. This is reported for the whole SMP frontage in Chapter 4, with specific details for each Policy Unit presented in Chapter 5 of this document.

Chapter 4 includes the 'Plan for balanced sustainability' (4.1) defining the broad environmental impacts of the Plan, based upon the appraisal of objectives. This chapter also presents the 'Predicted implications of the Plan' (4.2) under thematic headings.

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

2.8 MONITORING REQUIREMENTS

Where the implementation of any policy has specific monitoring/studies requirements to clarify uncertainties this is identified in the relevant 'Policy Unit Statement' (Chapter 5) and carried through as specific actions in the Action Plan (Chapter 6). Such studies include further monitoring and assessment of habitat creation opportunities and the requirements for social mitigation to be approved prior to changes from a policy of holding the line. Detailed monitoring and definition of mitigation requirements will be undertaken as part of strategy studies, rather than the SMP.

3 Basis for development of the Plan

3.1 HISTORICAL PERSPECTIVE

The shoreline throughout much of the area covered by this SMP is retreating, and has been doing so for centuries. This is very much part of a natural process which has been taking place as sea levels have slowly risen, and land levels have gradually dropped, the latter being the very long-term consequences of the last ice-age, which is still having an impact. The erosion we see today therefore is nothing new.

There are well recorded losses of communities along the coast in the past few hundred years, which are evidence of this long-term natural change; these include Shipden (off Cromer), Wimpwell (off Happisburgh), Waxham Parva (off Waxham), Ness (off Winterton), and Newton Cross (off Hopton), whilst many of the present villages were once also much larger in size. For example, photographs exist from Victorian times showing the ruin of Eccles Church on the beach. Clearly at one time this was inland, but today that same point now lies some distance off the present shoreline. Flooding is also nothing new; prior to the major floods of 1953 there had been numerous breaches through the dunes between Eccles and Winterton. Further information on past changes can be found in “Claimed by the Sea” (Weston & Weston, 1994), which provides an excellent description of historic coastal changes along this SMP shoreline.

These events all took place well before the shorelines were defended to the extent they are at present, or before other activities such as dredging were taking place. Therefore, although humans may have impacted upon the change occurring at the shoreline, they have not caused it. Equally, there is no reason to suggest that this natural change is not still taking place, nor that we should assume that it will not continue to take place in the future. Human intervention will not halt this natural process; coastal defence works carried out over the last century have not prevented natural change from occurring, they have simply delayed its full implications from being felt. This is one approach to resist erosion and shoreline retreat, but it is only sustainable for short periods of time. The decision to be made now is how we are going to manage this natural change in the future.

3.2 SUSTAINABLE POLICY

3.2.1 Coastal processes and coastal defence

Changes at the coast

Sea level attained a level close to its present position about 5,000 years ago, and the modern hydrodynamic regime has been operating since this time. The role of sea level rise in affecting shoreline evolution is thought to have been limited over the last 2,000 years, due to the low rates of change (averaging less than a millimetre per year), but we have now entered a period of sea level rise, which could result in the destabilisation of present coastal systems. Climate change is also likely to increase rainfall and storm events. We are also now living with a reduced resource of sediment on many of our coasts, as the sediment supply associated with the onshore transport of offshore sediments has diminished. This problem has been exacerbated at some locations in the last century due to human intervention reducing the contemporary sediment supply from cliff erosion by the construction of coastal defences and harbour arms. Licensed aggregate dredging is often cited as a

cause of erosion, but studies conducted to assess this activity indicate that it does not have a noticeable impact upon coastal evolution, and there is no evidence to the contrary. Indeed there are many other observations that can be made to support these studies, including the fact that significant erosion of this coast took place long before present dredging activities commenced. The existing licensing process provides a system for ongoing monitoring and assessment and all coastal authorities and the Environment Agency are consulted about licence applications.

As already discussed, the erosion of the shoreline is nothing new; this is an ongoing natural process, but we are more aware of it than in the past. However, it is not just the shoreline that is naturally changing, but the whole coastal system, i.e. the backshore, beach and nearshore (sub-tidal) zone. Along much of the Norfolk coastline, this movement is occurring in a landward direction as sea levels rise, with the shoreline responding to the increase in energy reaching it from the sea. Although attention is focussed upon the shoreline position, this process also produces a deepening of the seabed at any particular point. That change in seabed level is evidenced by the now lost villages, and even former defences that are still visible from the shoreline (e.g. at Corton). These locations were once on land, or at least at beach level, whereas today the same locations are in several metres depth of water. Defence of those settlements would not have prevented the foreshore lowering; i.e. they would today stand adjacent to very deep water. We should not expect the future to be any different and as such the foreshore level at existing defence locations may be anticipated to be much lower than present beach levels. Indeed accelerated sea-level rise will increase the magnitude and speed of change.

If we choose to continue to defend our shorelines in the same locations that we do at present, then the size of the defences will need to alter considerably; one consequence of deeper water is much larger waves at the defence. Defences will need to be wider to remain stable against bigger waves, have deeper foundations to cope with falling beach levels, and be greater in height to limit the amount of water passing over the top of them in storms. The appearance of these future defences will therefore be quite different to that of existing defences.

Sediment movement

The alongshore movement of sediment eroded from cliffs is essential to provide beaches locally and further afield. Beaches provide a natural form of defence that reacts to storm waves; they do not prevent further erosion but do help to limit and control the rate at which this takes place, so a wide and high beach offers greater protection than a low and narrow one. They also help to provide environmentally important habitats, important coastal landscapes, tourism, recreation and local amenity benefits.

A sustainable shoreline sediment system is one that is allowed to behave naturally without any disruption. It has been demonstrated many times over that the area covered by this SMP is, almost entirely, one connected sediment system. Cliff erosion, especially in North Norfolk, provides material to locations as far south as Lowestoft. Therefore the interference with the system at any point along the coast can have detrimental impacts some considerable distance away.

Policy options that result in heavy defence of the shoreline can have a considerable effect on this process, as described further below. Defences can be introduced without creating adverse effects, but

defence management needs to work with these processes in order to avoid problems at other locations.

Defence impacts

In general, there is less of an acceptance of change than in the past and it is apparent, through the developments of SMPs and strategy studies, that there is often a public misconception that change at the coast can be halted through engineering works. There is often a demand to continue to "hold the existing defence line", in order to protect assets, but this is coupled with an expectation that the shoreline will continue to look exactly as it does now. Due to the dynamic nature of our shoreline, this is incorrect in many, if not most, instances.

If we were to continue to defend into the future as we have done in the recent past, the long-term picture would be one of a very fragmented shoreline, characterised by a series of concreted headlands with embayments between. Seawalls would have resulted in a series of large promontories, in many cases extending 100 to 200m out from the adjacent (undefended) eroded shoreline by the end of the 21st century. These promontories would be highly exposed to waves in deep water, requiring much more substantial defences to be constructed. These defences would also need to be extended landward to prevent outflanking of the present seawalls. There would be no beaches present along these frontages and the groynes would become redundant; water would remain present at the structures at all times. Lowestoft Ness today provides a good example of how most, if not all, of the defended frontages within this SMP area might look in the future.

Beaches would not be present because of the transgression of the shoreline and increased exposure to larger waves, as a result of greater water depth at these promontories. Beaches are not found on headlands, for example around Devon and Cornwall, where water depth and exposure to waves is usually greatest and there is no reason to believe that the artificial headlands formed from concrete structures should be any different.

These prominent areas would also act as a series of terminal groynes; effectively eliminating the exchange of sand or shingle alongshore throughout much of the SMP area. As such, these headlands could help to stabilise beaches locally on their up-drift side, but would also increase erosion down-drift. The deeper water at these headlands would be expected to result in the deflection offshore of any material reaching these points; the material being lost from the shoreline rather than moving down the coast. As a consequence, other locations would be deprived of beach material and would therefore be likely to experience even greater erosion.

The rate of cliff retreat in the areas between these promontories would also be expected to increase as sea level continues to rise. The lack of beach material would worsen this situation and whilst local pocket beaches could develop, overall there would be far less sand retained on the shoreline and it is expected that even those areas freely eroding would not have significant beaches. The recent erosion to the south of Happisburgh village illustrates this, where there has been significant cut back adjacent to the defended section of shoreline but, despite this erosion, a wide and naturally defensive beach has failed to develop.

3.2.2 Economic sustainability

One of the difficulties facing us, as a nation, is the cost of continuing to protect shorelines to the extent that we do at present. The first coastal defences constructed in this area were predominately privately funded as part of wider-scale cliff-top development of properties. When built, they did not, in general, have to take into account the effects the defences may have on other sections of the coast, in terms of environment, economics, coastal processes or social matters. Importantly, they did not take into consideration the potential impacts Many of the defences that exist today have therefore been the result of reactive management and without consideration (or perhaps knowledge) of the long-term consequences and impacts on those nearby who may suffer due to increased erosion as a result.

Studies over the past few years have established that the cost of maintaining all existing defences is already likely to be significantly more than present expenditure levels. In simple terms this means that either more money needs to be invested in coastal defence, or defence expenditure has to be prioritised. Whilst maintaining existing defences would clearly be the preference of many of those living or owning land along the coast, this has to be put into context of how the general UK taxpayer wishes to see their money used. In the narrowest sense, given that the cost of providing defences that are both effective and stable currently averages between £2million (e.g. timber revetment) and £7million (e.g. wall and promenade) per kilometre of coast, the number of privately owned properties that can be protected for this investment has to be weighed up against how else that money can be used, for example education, health and other social benefits. There may be opportunities, or even an expectation, that beneficiaries may pay for, or at least contribute towards, the costs of defences. It is also important to consider other options, such as managed realignment, which may protect a proportion of the properties at risk, but which may be substantially cheaper. Notwithstanding this, investment to defend certain stretches of coast over the last century has led to an expectation in the local communities that this level of investment will continue into the long term. To maintain economic sustainability it will therefore be necessary to take a staged approach, to ensure that certain social and economic measures are identified before the defence of the section of coast ceases.

These recent studies have also established that the equivalent cost of providing a defence will increase during the next century to between 2 and 4 times the present cost (excluding inflation or other factors) because of the climate changes predicted, which would accelerate the natural changes already taking place, and decisions to defend or not must take these other factors into account. Consequently those areas where the UK taxpayer is prepared to continue to fund defence may well become even more selective and the threshold at which an area is economically defendable could well shift. Whilst it is not known how attitudes might change, it is not unreasonable to assume that future policy-makers will be more inclined to resist investing considerable sums in protecting property in high risk areas, such as the coast, if there are substantially cheaper options, for example facilitating, in planning, economic, and environmental terms, the construction of new properties and communities further inland. Such initiatives will be essential in order to maintain the social sustainability of the area, but there may be significant challenges in getting to this position. In the meantime, routine and reactive maintenance of the existing line may be justified until such measures can be implemented.

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

The implication of these national financial constraints is that protection is most likely to be focussed upon larger conurbations and towns, where the highest level of benefit is achieved for the investment made, i.e. more properties can be protected per million pound of investment. The consequence is that rural communities are more likely to be affected by changing financial constraints, on the renewal of defences. From a national funding perspective, an overall economic analysis is required, which at this stage is outside of the scope of this plan, in particular as it is not addressed in the guidelines for preparing Shoreline Management Plans.

3.2.3 Environmental sustainability

Environmental sustainability is difficult to define as it depends upon social attitudes, which are constantly changing.

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

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

Natural Environment

The forces of nature have created a variety of landforms and habitats around the coastline of Norfolk and Suffolk. The special quality of the natural habitats and geological/ geomorphological features on this coast is recognised in a number of national and international designations, protected under statutory international and national legislation, as well as regional and local planning policies.

There is a *legal* requirement to consider the implications of any 'plan or 'project' that may impact on a Special Protection Area (SPA) or Special Area of Conservation (SAC), through the Conservation (Natural Habitats, &c.) Regulations 1994. The Defra High Level Target for Flood and Coastal Defence (Target 9 – Biodiversity) also requires all local councils and other operating authorities to:

- avoid damage to environmental interest
- ensure no net loss to habitats covered by Biodiversity Action Plans
- seek opportunities for environmental enhancement

A requirement for the SMP is therefore to promote the maintenance of biodiversity and enhancement, through identifying biodiversity opportunities.

Coastal management can have a significant impact on habitats and landforms, both directly and indirectly. In places, coastal defences may be detrimental to nature conservation interests, e.g. through resulting in coastal squeeze, but in other locations defences may protect the interest of a site,

e.g. freshwater sites. Coastal habitats may also form the coastal defence, e.g. the sand dune complex at Winterton-on-Sea. Therefore coastal management decisions need to be made through consideration of both nature conservation and risk management.

Although the conservation of ecological features in a changing environment remains key, in terms of environmental sustainability, future management of the coast needs to allow habitats and features to respond and adjust to change, such as accelerated sea level rise. It is recognised that true coastal habitats cannot always be protected in situ because a large element of their ecological interest derives from their dynamic nature and this is important to ensure the continued functionality of any habitat. This poses a particular challenge for nature conservation and shifts the emphasis from site 'preservation' to 'conservation'. Therefore, accommodating future change requires flexibility in the assessment of nature conservation issues, possibly looking beyond the designation boundaries to consider wider scale, or longer term, benefits. An example of this is the Broads, designated for their freshwater habitats, which are currently protected by hard defences. There is, however, a possibility for the development of a functional and therefore sustainable coast, with massive gains in habitat (CHaMP; Posford Haskoning, 2003a), but of a very different type (brackish water, coastal lagoons, saltmarsh etc), with losses of, or damage to, some of the designated sites, which potentially goes against the current requirements of the European Union Directives.

The SMP also needs to consider opportunities for enhancing biodiversity throughout the SMP area, not just at designated sites. It has been identified that one of the main biodiversity opportunities within this SMP area may be gained through allowing more natural coastal processes to take place, particularly along the stretches of eroding cliffs between Sheringham to Happisburgh (Posford Haskoning, 2003b).

Human (Socio-Economic) Environment

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

Land-use:

Historically, development of the coast has taken place unconstrained. In 1992 Planning Policy Guidance 20 (PPG20) identifies that approximately 30% of the coastline of England and Wales is developed; however much of this development took place before the introduction of the Town and Country Planning Act 1947. PPG20 has now been superseded by a supplement to PPS 25: Development and Coastal Change that promotes the concept of Coastal Change Management Areas. These place restrictions on development in areas at risk of coastal change (whether through flooding or erosion), but is balanced by the need to consider re-development in non-risk areas. . Growth of built development, both commercial and residential, within the coastal zone over the centuries has increasingly required engineering works to defend properties against the risk of erosion and flooding. However, continued construction of hard-engineered coastal and flood defences to protect development may not be economically sustainable in the long-term (see Section 3.2.2). Local Development Frameworks should now identify the need for 'sustainable development'; although the exact definition of this is uncertain, it recognises that opportunities for development on the coast are limited due to risk of flooding, erosion, land instability and conservation policies (as discussed above).

The PPG25 states that in the coastal zone, development plan policies should not normally permit development which does not require a coastal location. Tourism/ recreation is one land-use that can require a coastal location and although the popularity of many British seaside resorts has declined in recent years, seaside tourism often still represents a substantial part of the local economy. In this area the Broads, which are sited inland from this coast, are also an important tourist location. Therefore impacts on the tourism industry need to be considered in development of a coastal management strategy, understanding what features attract tourists to a location.

The coastal strip also represents an important recreational and amenity resource; many activities rely on the presence of a beach or access to the sea. Although assets to landward of current defences and access routes may be protected through maintaining existing defences, it must be recognised that continuing such defence would in the longer term result in a significant alteration in the nature of the coast, with large concrete seawall structures and few beaches. Public Rights of Way are also associated with many sea walls and cliff tops and play an important recreational and community role, which has been recognised in the CROW Act (2000). Where there are changes of policy from holding the line to natural or managed realignment, the relevant strategy studies will need to take into account the impact on coastal access opportunities.

In addition to the tourist industry, there are a number of other commercial interests along the coast – these tend to be concentrated in the large towns such as Sheringham, Cromer, Great Yarmouth and Lowestoft, although it is not limited to them. The Bacton Gas Terminal is of particular economic importance. The continuation of these industries is essential to sustain the current economy of the region as a whole.

Heritage:
Heritage features are valuable for a number of reasons (English Heritage, 2003):

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

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

Landscape:
Part of the SMP coast is designated as an AONB and is therefore regarded as having the a similar status to a National Park, in planning terms. However, in general, landscape is difficult to value objectively as it is a mixture of the natural environment and social and cultural history. Therefore defining a sustainable landscape is usually dependent upon the human and natural environment factors discussed above.

Communities

Possibly more than any other type of community in the UK, coastal communities are sensitive to environmental and economic change. The Index of Multiple Deprivation (IMD) 2004 and the 2001 Census clearly highlight the existence of deprivation around the English coast. Coastal resorts tend to suffer from problems comprising the worst aspects of both urban and rural deprivation including lower employment levels, lower quality of employment, higher sickness & disability benefits, a lack of economic diversity, seasonal visitor impacts and associated pressures on local services, immigration of older people and out-migration of younger people. Many of these issues are worsened where the coast is at risk from coastal erosion or flooding, particularly due to the limitations on development and regeneration that this poses.

4 The Shoreline Management Plan

4.1 PLAN FOR BALANCED SUSTAINABILITY

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

The present-day policy options developed for this SMP provide a high degree of compliance with objectives to protect existing communities against flooding and erosion. The long-term Plan promotes greater sustainability of the shoreline and one more in keeping with the natural character of this coast. The purpose of an SMP is limited to coastal defence, and it does not seek to address the consequences of coastal change; however it does seek to highlight those issues that will need to be addressed, and a 'road map' for addressing these is provided in the Action Plan.

Continuing to defend the shoreline in a manner similar to today would produce a significant alteration in the nature of the coast, with large concrete seawall structures and few beaches. This might maximise protection to property and land, but would be both difficult and very expensive to sustain. It could also be damaging to the natural environment, and coastal industries, such as tourism, that rely upon the character of the coast to attract visitors.

The rationale behind the Plan is explained in the following sections of text, which consider the SMP area as a whole, albeit described in four main sections, which are shown on Figure 2. Details of the policies for individual locations to achieve this Plan are provided by the individual statements in Section 5.

4.1.1 Kelling to Cromer

The towns of Sheringham and Cromer provide two of the main centres in the whole of North Norfolk. These towns are both situated on the northward facing shoreline, which is characterised by low rates of sediment transport and relative stability when compared to much of the rest of the SMP coastline. Furthermore, the eroding cliff between these towns provides little contribution to beaches beyond these points. Therefore both Sheringham and Cromer can be protected for the foreseeable future without unduly compromising protection of other frontages. Both towns have a range of facilities that service other communities in the area and are key locations for local trade, including the tourism industry. There is strong justification for seeking to prevent erosion of these particular frontages and the consequent loss of properties and services.

It is unlikely in the long-term that any beach would exist in front of these defences, therefore the character of these frontages would alter, although some beach would probably still exist between these two towns, due to erosion being allowed to continue.

Elsewhere between Kelling and Cromer, it is highly improbable that there would be economic justification for future defence. Therefore, the Plan is to allow retreat once existing structures reach the end of their effective life.

4.1.2 East of Cromer to Happisburgh

This is the most active length of coast within the SMP area and is the main provider of sediment for beaches throughout much of the SMP frontage. The erosion of this section is necessary to (a) allow beaches to build, which will help avoid accelerated erosion of the shorelines here and elsewhere and thus provide better protection to towns and villages, and (b) satisfy nature conservation and biodiversity requirements.

Because of the rapid natural erosion rates here, fixing the shoreline in any location will result in a sizeable promontory forming. Along this section, this would be likely to act as a terminal groyne in the long-term, with material reaching this point more likely to be deflected offshore and lost altogether rather than either remaining as a beach in front of these defences or reaching destinations downcoast.

However, there are numerous assets that would be affected by wholesale abandonment of defences through this area, notably the sizeable villages of Overstrand and Mundesley, Bacton gas terminal, and the smaller settlements of Trimingham, Bacton, Walcott and Happisburgh. The continued defence of these areas is not sustainable in the long-term for the reasons highlighted above. In most cases it is also highly unlikely that such a policy could continue to be economically justified in the long-term. Consequently, the policy options for this area need to allow for managed change; continuing to provide defences where justifiable for the immediate future, but with a long-term Plan to gradually retreat and relocate, thus enabling a naturally functioning sustainable system to re-establish.

Both Overstrand and Mundesley will continue to develop as promontories if their present positions are defended, which would result in as much as 70% of the sediment supply to beaches throughout the SMP area being isolated or lost offshore. Similar arguments apply to Bacton gas terminal. Consequently, the most sustainable approach for the SMP as a whole is to retreat at these locations in the medium to long-term, although this would require the relocation of a large number of people, property and services within these settlements. The Plan will therefore seek to maintain present defences for a period of time to put in place the mechanisms required to facilitate such changes. It is important to note that should a policy of retreat not be adopted at all locations, this would put into doubt the policy options set elsewhere along this stretch and to Winterton to the south.

These same arguments apply to the remaining settlements along this stretch of coast, i.e. defending them is not sustainable as it will contribute to even more significant problems elsewhere. Furthermore, there is generally insufficient economic justification for replacing defences to these smaller settlements. Therefore the policy option is to not maintain existing structures. Whilst erosion may initially occur at a significant rate, as the shoreline reaches a more natural profile this rate will slow down as the release of more sediment to the beaches will mean greater natural protection is afforded.

The Plan will mean allowing unabated erosion throughout much of this area in the longer term. To manage relocation, occasional measures to temporarily delay (but not halt) this erosion from time to time may be acceptable in some locations where there are larger concentrations of assets, i.e. Overstrand, Mundesley and Bacton gas terminal.

4.1.3 Eccles to Great Yarmouth

Sustainability in all senses of the word can be optimised throughout this section if minimal intervention is practised. This therefore underpins the long-term Plan for this area.

Similar arguments, as those presented for the shoreline to the north, apply to this length of coast, i.e. hard defence of existing positions will prevent the natural movement of sediment, and structures will become increasingly difficult to maintain or justify over time, as the coastal system retreats. This whole length of coast is reliant upon sediment eroded from the cliffs of North Norfolk for beaches to provide natural defence, although in recent years this has been supplemented through recharging beaches along the Eccles-Waxham frontage and at Caister, which has addressed any shortfall in material supply.

The dangerously low beaches experienced in front of the Happisburgh to Winterton sea defences in the late 1980s and 1990s are a measure of how advanced coastal retreat had become. Reactive measures to address this produced a scheme to defer further problems for the next 50-100 years, but it is recognised that beyond that time continuing to apply these measures may become increasingly difficult to sustain. The impacts upon areas further downcoast, i.e. Winterton and beyond, may also be significant if this position continues to be held in the long-term as they will ultimately receive no natural sediment, which would significantly deplete beaches and accelerate erosion. The policy option for this area therefore is to investigate the potential for change whilst still defending, with a view to longer term set-back of the defences, as and when it is confirmed that it is no longer sustainable to defend. The policy is therefore conditional on the continued technical, economic and environmental sustainability of holding the line. There are various alternative realignment options, each having different implications for land use and biodiversity. All should, however, enable a naturally functioning system to re-establish, as long as this change is not deferred for too long.

To be consistent with the realignment policy option to the north, the approach for Winterton to Scratby is one of managed realignment, however if physically possible and funding is available, the line will be held at Scratby in the short term to allow for social mitigation measures to be developed. In addition some localised dune management will be put in place.

At the southern end of this section is Great Yarmouth. With the exception of the northern and southern extremities of the town, defence is primarily provided by an extremely wide and healthy beach, which has been fed by sediment derived from cliff erosion in Northeast Norfolk. Even with the onset of sea level rise, this beach is expected to continue to provide ample protection without the need for any intervention, other than at the extremities, provided that a sediment supply is maintained. If material does not continue to reach this destination then accelerated erosion may take place, necessitating the introduction of major defence works in the future as Great Yarmouth is the major economic centre within this SMP, and is a location that justifies full protection against erosion or flooding. This needs to be reflected by adopting complementary policy options for the presently defended areas of California and Caister. Whilst these locations will continue to be defended for some time, if this continued into the long-term, these would become very pronounced, potentially interrupting sediment transport to Great Yarmouth and beyond, and indeed the rest of Caister itself. Therefore the longer term Plan has to allow for some realignment of the shoreline to take place northwards from Caister Point to enable improved material movement along this coastline. This will still result in the protection of most development at Caister, whilst helping to ensure the protection of all assets in Great Yarmouth and maintaining the nature conservation interests here also.

4.1.4 Gorleston to Lowestoft

There are considerable numbers of properties between Gorleston and Lowestoft. As a result of Great Yarmouth having been built on a former spit, Gorleston is already set back from the coastline to the north, and is not interrupting the transport of any sediment that travels southwards bypassing the harbour. The construction of the Outer Harbour was identified at planning stage as having potential to alter sediment movement with implications for shoreline management actions to the north and [more likely] south. In response a rigorous monitoring and impact assessment process was agreed between operating authorities and the Port Authority. If significant impacts are identified that are attributable to the port development then mitigation by the Port Authority will be required. The continued defence of this area can therefore be achieved without this becoming a promontory and the high economic value of properties at Gorleston, as well as it being part of the regionally important conurbation of Great Yarmouth, justify continued protection as long as this is sustainable. However, future defence would be more sustainable with a sediment input, which may be achieved through erosion to the north.

Lowestoft is a major town with commercial assets located at or around Ness Point. This is already a highly pronounced promontory and has little beach remaining, due to its exposure. However, material does not bypass this point to feed beaches to the south; therefore protection of these assets will have no impact elsewhere. Even with an increased supply of sand to this area, beaches could not be retained. Therefore achievement of the Plan will require substantial structures, although a supply of beach material is also important to reduce the risk of residential property loss and pollution risk at the north end of Lowestoft at Gunton, and to maintain environmental interests there. It is understood that the proximity, nature and height of the offshore sandbank at this location has a much greater influence on the presence or absence of a beach than does the supply of sediment from the north.

Between Gorleston and Lowestoft lies Corton, where there are also a considerable number of properties. This area has a history of erosion problems and it will only be possible to defend in the medium to long term once there has been some realignment, commencing with a natural realignment of the coast. The past problems have resulted from continual attempts to prevent erosion since Victorian times, resulting in this frontage almost continually existing as a promontory since these times. This has made the retention of a sustainable beach increasingly difficult, adding to the stress upon any structures placed at the foot of the cliff, and interrupting the transport of sand to Gunton and Lowestoft, exacerbating problems there. The key to the more sustainable management of Corton and not accelerating the erosion at Lowestoft, is to allow the shoreline to retreat to its “natural” position, in line with the coast to the north and the south, thus ensuring a sediment supply to support a beach. The Plan therefore is to not attempt to prevent retreat once the present defences at Corton reach the end of their effective life, although some erosion-control measures might be acceptable in the long-term.

Important to the settlements of Gorleston and Lowestoft is an adequate supply of beach material. The majority of this will need to come from local cliff erosion. These beaches will reduce exposure and volatility, helping to lower the rates of erosion there and reduce additional defence needs. The long-term Plan is therefore to allow the cliffs between these locations to freely erode, through not replacing existing defences once they reach the end of their life. Whilst some losses of land and property will inevitably result, this material is necessary to provide the greater benefits elsewhere.

The defence line will be initially maintained at Hopton, to protect what is mainly holiday property. However, attempting to protect this area into the long term will simply reproduce the problems already experienced at Corton. This would include loss of beach, which is a prime attraction for these holiday facilities and without which the attraction of the area as a holiday destination would be severely reduced. If this area were allowed to develop as a promontory it would also be disruptive to the transport of sediment and therefore beach development and natural defence of other areas. It is therefore essential that whilst defences are maintained in the short to medium term, appropriate social mitigation is identified and implemented at this early stage, with a view to allowing maintenance of defences to cease in the longer term. This important policy decision would need to be confirmed by detailed investigations and, as with other areas, would be subject to a review of the coastal strategy.

4.2 PREDICTED IMPLICATIONS OF THE PLAN

In the longer term, there will come a point at many locations when we can no longer justify, in economic, technical and environmental terms, measures to prevent coastal erosion. Although in places we may not have reached this stage, we need to begin planning for this situation. Accepting that it is not possible to continue to provide defences to the extent that we have in the past century, the implications of this Plan are presented below.

Direct comparison is made between the selected policy options and a no active intervention policy; this being the position if no money was spent on coastal defence. This defines the benefits of the Plan.

4.2.1 Implications for people, property communities, and land use

For much of the SMP coastline the policy, at least for the present, is to maintain existing defences where economically viable. This is to minimise loss of property and assets along the coastline. In this respect, the key areas of residential and commercial developments have been recognised as Sheringham, Cromer, Great Yarmouth (and Gorleston) and Lowestoft. It has been recognised, however, that a hold the line policy along large stretches of the remaining shoreline may not be technically sustainable or economically viable (when considering the SMP shoreline as a whole) in the longer term. Where there are proposed policy options for longer term 'managed realignment' or 'no active intervention', it will be important to work with local communities to identify and assess the opportunities to mitigate the impacts on the lives of individuals and communities. Such assessment will be undertaken as part of Coastal Strategy Studies, the scope of which will include the need to further test to social, economic and technical viability of the policy option.

For the selected policy options, the total loss of housing up to year 2025 (excluding the Eccles to Winterton frontage) is approximately up to 80 houses and 5 commercial properties. This compares to the no active intervention baseline, when approximate losses would be up to nearly 200 houses and 20 commercial properties. Consequently, the Plan provides for protection to over 100 properties otherwise at risk from erosion during the next 20 years. These figures do not include the floodplain currently defended between Eccles and Winterton: along this frontage residential losses would be up to 1530 houses and 130 commercial properties under a no active intervention baseline, compared to no loss under the Plan of maintaining existing defences.

By year 2055, approximate housing losses as a result of coastal erosion will total between circa 80 and 450, with cumulative losses of between circa 450 and 1,300 houses by the year 2105. This

compares to the no active intervention baseline, when cumulative house losses could be up to 1,000 by 2055, and approaching 2,700 by 2105, if the protection measures were not afforded, i.e. the Plan delivers protection to well over 2000 'at risk' properties over the next 100 years.

Similarly the cumulative commercial losses under the Plan could approximate up to 80 by 2055 and 170 by 2105, compared to the no active intervention baseline, when losses could be up to circa 300 and 550 respectively. Consequently, the Plan also provides for protection to approximately 400 'at risk' commercial properties over the next 100 years. Equivalent figures for the Eccles to Winterton floodplain area will be dependent upon the long-term line of defence, which is yet to be determined.

Tourism is an important economic sector. Whilst the key centres for tourism are Lowestoft, Great Yarmouth, Cromer and Sheringham, there are caravan and holiday parks spread out along the coast, often along the coastal edge. Along the undeveloped frontages between the main towns and villages, many of these will be lost within the next 50 years, due to coastal erosion. Within Mundesley, Overstrand, Caister, Hopton and Corton, losses will occur during various time periods, but the Plan includes provision for management of the realignment at some of these locations, to allow relocation or mitigation measures to be implemented. At Lowestoft, Great Yarmouth, Cromer and Sheringham, the Plan will continue to protect tourist assets, but as noted below there may be a detrimental impact on the tourism through loss of beaches at Lowestoft, Cromer and Sheringham. A further significant consequence of policy implementation involving a change from HTL to MR or NAI is the need to proactively manage the defences that are no longer required to provide protection. Defence ruins will pose significant public safety and navigation hazards and introduce constraints to public recreational opportunity. For these reasons the management of redundant defences is to be considered as an integral part of measures featured in the SMP Action Plan. The Broads is also an important tourism resource, contributing greatly to the local tourism economy; the area of the Broads extends beyond the limit of the SMP and the area that would be directly affected is about an eighth of the whole Broads Authority area, but the effects could extend upstream of the River Thurne, and the area affected is the only coastal stretch of the Broads. Therefore the implementation of a managed realignment policy would have an impact on the use of this area as a recreation and tourist resource, although at the current time there is uncertainty as to how this area would evolve and therefore the full impacts of such a scheme are not known. Further studies are planned as part of the Happisburgh to Winterton Sea Defences Strategy Review and until this time the policy option will remain to hold the line.

Agriculture also represents an important share of the local economy and along the coast there are various grades of agricultural land, but mostly grade 2 and 3 between Kelling and Cromer, grade 1 and 2 between Eccles and Winterton and , which is an important national resource. Along much of the SMP coast, these areas are in the undeveloped stretches between the towns, where there is insufficient economic justification for maintaining or constructing defences, which would also be technically inappropriate. Under the Plan there will be loss of a total of approximately 400 hectares by 2105, which is approximately the same as would be lost under a no active intervention policy. These totals exclude the Eccles to Winterton frontage, which includes the main area of Grade 1 land. In the short to long-term, there will be continued protection afforded under the Plan, but if it becomes unsustainable to hold the line a retired line option would result in loss or damage to this land: the extent of which would depend upon the retired line, but could range from 700 to 6,500 hectares.

Bacton gas terminal is recognised as a key infrastructure feature along this SMP shoreline; therefore the Plan is to continue to protect this site from erosion for the next few decades, but it is recognised that in the longer term some retreat will be necessary. In addition to the gas terminal there are various infrastructure assets at risk, including roads and services (e.g. water supply, sewage and drainage systems), which will require relocation as the Plan is implemented.

4.2.2 Implications for nature conservation

Along the Kelling to Sheringham frontage, the shingle beaches, although not specifically designated, have associated Biodiversity Targets, which require natural processes to occur and that the shingle barrier ridge at Kelling be allowed to roll back naturally. Both these targets will be met by the Plan, which allows the shingle beach to roll back with the cliffs.

Immediately South West of Cromer lies the Overstrand cliffs SAC. The cliffs present one of the best examples of unprotected vegetated soft cliffs on the North Sea coast in the most easterly part of the UK. The cliffs are up to 70 m high and are composed of Pleistocene sands and clays with freshwater seepages in places and are subject to moderately frequent cliff-falls and landslips. Much of the length is unprotected by sea defences and is therefore natural in character. The vegetation exhibits cycles of succession with ruderal communities developing on the newly-exposed sands and mud followed by partially-stabilised grasslands and scrub. Seepage areas support wet fen communities and in places perched reedbeds occur. The diverse range of habitats supports an outstanding range of invertebrates.

To the north of Happisburgh, the coast is also characterised by high cliffs, which support a diverse range of invertebrate and maritime plant communities as well as being nationally important for their geology and geomorphology. A Biodiversity Target for this area is to promote policy options that, where possible, will maintain the free-functioning of coastal process acting on maritime cliff and slope habitats. Allowing continued exposure of the cliffs is also important to maintain the geological exposures for which these cliffs are also designated (e.g. West Runton Cliffs and Foreshore are designated as a SSSI for its paleo-geological interest. In the long-term these objectives are achieved along a large proportion of the SMP coastline, through allowing previously protected areas to retreat, whilst accepting that in the short term properties still need to be protected. The main exceptions in the long-term are Sheringham and Cromer, which are recognised as key service centres. Erosion and retreat of the cliffs may result in loss of cliff top habitats due to coastal squeeze, many of which are designated as SSSI or CWS sites, unless there is provision made for these sites to be allowed to roll back with the cliff line.

There is also a Biodiversity Target associated with the littoral and sublittoral chalk platforms between Cromer and Overstrand, which is the only site in East Anglia to support hard rock marine communities. The Plan which allows retreat of the softer cliff material at this location should provide for continued exposure of these harder chalk platforms, which are likely to be revealed as the cliffs retreat in response to sea level rise. The SMP cannot, however, combat the potential submergence of these areas as a result of accelerated sea level rise in the long-term.

To the south of Happisburgh there are areas of nationally significant dune habitat and extensive dune heath. These are designated both for the habitats that they support, but also for their morphological interest, which in part is dependent upon a dynamic system; one of the Biodiversity Targets is to allow

natural processes to operate. Part of the dune system is currently protected by the seawall along the Eccles to Winterton frontage and therefore any change in policy along this frontage may result in some loss of this habitat. There is uncertainty with respect to how the dunes may respond if the seawall were lost, but it is possible that they would not roll back but instead would be eroded and lost; therefore it has been recommended that studies of beach-dune response are undertaken should a policy option of holding the line prove to be unsustainable in the future. Another significant area of dune is Winterton Ness, which is internationally designated as a Special Area of Conservation; this is also an area where there is large uncertainty, due to lack of understanding of the mechanisms of ness evolution and linkages to the offshore. This area would also be affected by any changes in policy along the Eccles to Winterton frontage and would also require further study prior to the implementation of a change to a retired line option. However, if the present management practice were to be continued beyond the current timescale up to this Plan, it would require a significant amount of recharge to ensure that this area still receives sediment. It has been recognised by previous studies that the relict dune at Winterton could not be replaced, once it is lost.

The Broads is an extremely important area in terms of habitats, which are designated both nationally and internationally, and this is an area which will be dramatically altered should a retired defence line option be implemented. This option has potential to improve the diversity of the area (CHaMP, 2003), but would result in loss of, or damage to, some of the designated sites and could have potential impacts on habitats further inland. How this area would develop, and the types of habitats that could develop, or would be lost, is unknown at the present time, therefore as highlighted above, this is an area which requires further research before any policy can be implemented between Eccles and Winterton (further studies are planned as part of the Happisburgh to Winterton Sea Defences Strategy Review).

The beach-dune system at Caister and Great Yarmouth North Denes is currently an area of accretion and has been designated as a Special Protection Area for its birdlife. A small part of the site is currently defended, which will remain under the Plan, but the seaward edge is subject to natural fluctuations. However, there is potential for improvement in the long-term under the Plan due to the increased feed from the north as cliffs that have previously been protected are allowed to retreat. In the long-term, this may be countered by accelerated sea level rise; however the importance of Great Yarmouth as a commercial centre means that defences here will continue to be held so some coastal squeeze may start to occur. It is recognised that as part of achieving the Biodiversity Target, it would be necessary to implement dune management along this frontage, as much of the current loss appears to be caused by human disturbance rather than natural processes.

4.2.3 Implications for landscape

The long-term Plan for the SMP is for a naturally-functioning coast for much of the frontage, reducing man-made structures on the beach, which will ultimately create a more natural coastal landscape. This is more beneficial to the landscape than a policy of defending the whole coastline, which would involve construction of new, more substantial defences. However it is recognised that loss of some coastal villages, to which the AONB designation refers, will be detrimental to the landscape of this coast. Where there are overriding socio-economic factors it will be necessary for coastal structures to remain. It is recommended, as part of the Plan, that where the coastline is allowed to retreat, that this is managed to allow removal of houses and infrastructure, which would otherwise be unsightly and

dangerous. The removal of existing infrastructure will need to be considered in the implementation plan that forms part of the Coastal Strategies undertaken

One area where the long-term policy will have a major impact on the coastal landscape is between Eccles and Winterton. The policy option is to hold the line in the long term, however it is recognised that this may prove to be unsustainable technically and/or economically in the future. Here a retired line option would create a more natural landscape in the long-term, but with the loss of villages, historical sites and freshwater landscape, all of which contribute to the landscape quality. Therefore it is not possible to determine whether a change to the long-term Plan will have an overall beneficial impact on the Broads landscape, but it will be radically different from present. A change to a managed realignment policy would allow for management of the timing and extent of this retreated position, rather than the uncontrolled flooding which would take place under a no active intervention scenario. Holding the line in this area is likely to result in a landscape characterised by hard, probably more substantial, concrete structures and no beaches. If the policy changes to managed realignment, as a result of further assessment, it is possible that a more natural coastal landscape will be an aesthetically preferable one, but there are uncertainties over the type of landscape that could develop along this coast and therefore the change in landscape value.

4.2.4 Implications for the historic environment

There is a wide range of heritage sites along the coast and many more of these will be protected through the Plan for the SMP area than would survive a no active intervention policy. Many of those that would be lost as a result of the Plan are associated with wartime structures, which are located at the cliff edge. Some examples of these have already been lost, but where the policy has identified the need to manage retreat, there may be opportunity for mitigation schemes to be implemented.

The major area of potential loss would be the Happisburgh to Eccles frontage, where there are a large number of monument sites of high importance as well as listed buildings and a Scheduled Ancient Monument. The policy here is for managed realignment, but with an emphasis on slowing erosion and minor repairs to existing defences where this can be justified.

Many of the listed buildings within this SMP area are located within the towns of Sheringham, Cromer, Great Yarmouth, Gorleston or Lowestoft, all of which would be protected under the Plan.

4.2.5 Implications for amenity and recreational use

The coast is an important area for tourist and recreation use, with key interests concentrated along the coastal strip and in the Broads. This importance of access to the coast is reflected in The Marine and Coastal Access Bill, which received Royal Assent on 12 November 2009, which aims to create a coastal path around the entire coast of England.

Under the long-term Plan, the key centres of tourism and recreation of Sheringham, Cromer, Great Yarmouth, Gorleston and Lowestoft, will continue to be protected to maintain assets currently protected by the existing defences. At Sheringham, Cromer and Lowestoft, this will, however, be at the expense of beaches along these frontages, which are unlikely to be retained as the frontages become more prominent and therefore more exposed. The promenades along these sections will also become more exposed and less accessible; although the Norfolk Coast Path has already been set back between Sheringham and Cromer

Although there should be beaches retained where the coast is allowed to retreat, there will be potential access issues, with existing accesses often being lost, but there is potential, and in some places a necessity due to safety issues, for these to be re-established if funding is available, although relocation may be necessary. There will also be an impact on public Rights of Way, which will need to be considered as part of the Rights of Way Improvement Plans to be undertaken by each Highway Authority as part of the CROW Act 2000.

There will be loss, in the long-term, of local-level amenities and recreational assets within the smaller communities such as Overstrand, Mundesley, Scratby, Hopton and Corton. Golf courses at Sheringham, Cromer and Gorleston will continue to experience loss under the Plan. This may have the impact of discouraging long-term investment by the leisure and tourism industry in these 'at risk' areas on the coastal strip, which may impact on the regional tourism industry due to the loss, or lack of maintenance, of facilities and amenities. However, in the long-term a more natural coastline of sea cliffs and natural beaches may prove to be beneficial to future tourism in this area.

The Broads also represents an important recreational resource and the function of this area may significantly change, as discussed in Section 4.2.1, if the policy option of holding the line proves to be unsustainable in the long term.

The National Trail extends between Kelling and Cromer and sections of this will continue to be lost at varying time. There is potential however, subject to planning consents, for this to roll back as the cliffs erode.

4.3 MANAGING THE CHANGE

The consequences of the long-term management Plan for this coast should not be understated and in many cases the Plan recommends policy options that could be considered socially inequitable without further action. However, the inevitability of necessary change to past policies needs to be recognised. Continued defence, as practised in the past, is unsustainable in the long-term and it is unrealistic to present policy options that indicate continued defence of an area where this is unlikely to be sustainable or economically justifiable.

To achieve this change will, however, require consideration of the consequences at various levels of planning and government. There are matters that need to be debated at a national level, as the issues that have been identified by this Plan will exist several times over around the UK. It is not possible to achieve complete sustainability from all perspectives and quite probably national policies will need to be developed to help resolve the dichotomies.

4.3.1 Recommendations

The main vehicle for delivering the outcomes of the plan is the Action Plan (Section 6, Table 6.3). This is a comprehensive table of actions required in order to ensure that the recommendations made within the plan are taken forward. For each action a lead authority is identified and proposed due dates. The Action Plan will be a 'live' document which will be frequently reviewed and updated, and which will form the key agenda item at the regular coastal group meetings.

It is expected that this Plan will impact upon spatial planning at both the regional and local levels. Regional planning should ensure that future proposals for regional development and investment are made accordingly. Such planning needs to be looking beyond the current 20 year horizon.

Local planning should consider the risks identified in this Plan and avoid approving inappropriate development in areas at risk of flooding or erosion. It will also need to take account of the expected losses to the stock of housing, commercial premises and other types of development as a consequence of this Plan, in formulating policies and proposals for new development.

In order to accommodate retreat and loss of property and assets, whether due to coastal erosion or flooding, local operating authorities and others will need to develop management plans. These will need to address the removal of buildings and other cliff-top facilities well in advance of their loss to erosion. The plans for relocation of people (and communities) also need to be established and clear for all affected. These should, as far as possible, seek to ensure the long term sustainability of the coastal communities. However, mitigation measures do not fall solely upon national and local government, and should not be read as such within this Plan. Business and commercial enterprises will need to establish the measures that they need to take to address the changes that will take place in the future. This includes providers of services and utilities, which will need to make provision for this long-term change when upgrading or replacing existing facilities in the shorter term. They should also consider how they will relocate facilities that will become lost to erosion or flooding. Other parties needing to consider mitigation measures will be the local highways authorities and bodies responsible for local amenities (including churches, golf clubs etc).

Private land and property owners will also need to consider how they will deal with these changes. There is currently no obligation on the part of operating authorities or national government to assure protection against flooding or erosion. There is currently no mechanism by which individual losses would be recompensed from central funds. However, as a result of consultation responses to this and other SMPs, the Government has undertaken research into the range of mechanisms that could be made available to help individuals and communities to adapt to the changing coastline. This has resulted in the publication of a Coastal Change Policy in March 2010 which sets out ideas for how coastal communities can successfully adapt to the impacts of coastal change, and the Government's role in supporting this. Where appropriate, the approach taken in this plan is to hold the existing lines of defence until suitable social mitigation measures have been identified. Social mitigation in respect of coastal management is an emerging issue, and is currently being investigated in a number of 'pathfinder studies', funded by Defra. Social mitigation includes a range of issues and must:

- Be a readily understood and open process
- Be integrated within the wider policy framework for coastal management
- Acknowledge the effects of previous decisions
- Involve the community in identifying and solving problems
- Not repeat past mistakes
- Provide assistance to help members of the community deal with issues that individuals cannot easily resolve themselves
- Encourage the community to take responsibility for its own future.

The types of social mitigation that could potentially be identified as a result include:

- Providing low cost land for affected homeowners to move further inland.
- Public or Government acquisition and lease back of property and/or land.
- Direct and indirect help with rebuilding costs.
- Architectural design services.
- Help with securing planning permission.
- Assistance with legal costs.
- Free sources of advice (telephone, web or drop-in)
- Small increases in council tax to build a re-development fund to assist those directly affected.
- Council funded infrastructure to help move whole communities inland.

In addition, planning policy and development control decisions can be used in preparation for, and during the transitional period to, a new policy. For example, guidance might be issued on the nature of development that will and will not be permitted within vulnerable areas; 'finite life' permissions might be granted and/or incentives might be offered to facilitate the re-use of certain buildings. There are other measures that may not be adopted as policy, but where there is still scope for inclusion as local action. These include further research into this section of coast to try to provide more accurate predictions of erosion and flooding, research into specific areas to establish where relocation may be best achieved, etc. This final issue is addressed by introducing 'policy options' rather than policies that are 'set in stone'. This is in recognition of the fact that more detailed physical, environmental and social analyses will be undertaken within coastal strategy studies, which may conclude that the SMP policy options are not, in fact, deliverable. Where this does occur, the results of these more detailed studies will feed back into the next review of the Shoreline Management Plan policy options. It is vital however, that the various planning documents which will draw on the findings of the SMP, assume that the policy options will be taken forward. In this way local planning policy and proposals maps will gradually evolve to make the transition to the policy options more easily achievable once they are supported by coastal strategy work.

It should though be recognised that this approach may itself require reconsideration in the face of deteriorating defences and limited resources as funding may not be available for large scale repairs following a catastrophic event.

Prior to initiating any change of policy from Hold the Line to Managed Realignment or No Active Intervention it is also recommended that a more detailed economic analysis is undertaken. This will be undertaken in line with the Treasury Green Book, the Environment Agency Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM - AG) and Flood Defence Grant in Aid (FDGiA) guidelines, however if possible the analysis outlined in Appendix H will be extended to include physical factors such as infrastructure and non-physical factors such as community health and cohesion, tourism and amenity, heritage and business impacts. This assessment will be in the form of a Coastal Strategy Study.

The Plan provides a long lead time for the changes that will take place, which in general will not happen now but will occur at some point in the future. However, to manage the changes effectively and appropriately, the approach to this needs to be considered now, not in several decades time. Specific actions to take this forward are presented in the SMP Action Plan (section 6).

5 Policy statements

5.1 INTRODUCTION

This section contains a series of statements and maps presenting the policy options, and the implications for individual locations. These are to provide local detail to support the SMP-wide Plan presented in Section 4, and consider locally-specific issues and objectives. Consequently, these statements must be read in conjunction with those and in the context of the wider-scale issues and policy implications as reported therein.

5.2 CONTENT

Each Policy Statement contains the following:

Location reference This provides the general name used for reference to each policy unit and a number identifier which is sequential along the shoreline from north to south. A general location plan showing the extent of these units is provided in Figure 2.

Summary of the Plan recommendations and justification This is a statement summarising the Plan and describing the rationale behind it. These focus upon the long-term Plan but also note any different short term requirements.

Policy options to implement the Plan This describes the policy options and activities that will be undertaken in the short, medium, and long-term to implement the Plan. In this respect, 'from present day' is broadly representative of the next 20 years, "Medium-term" 20 to 50 years, and "Long-term" 50 to 100 plus years. These timescales should not be taken as definitive, however, but should instead be considered as phases in the management of a location. It is important to understand that for each policy recommendation, there is no guarantee that funding will be available for its implementation. Funding will be subject to wider economic factors and priorities; the policy option identified is simply what the aim should be in terms of management of the shoreline, should funding be available.

Predicted implications of the Plan for this location This table summarises the consequences *at this location only* resulting from the policy options. These are categorised as "Property & Land Use", "Nature Conservation", Landscape", "Historic Environment" and "Amenity & Recreational Use" (which are being used nationally for the SMPs). The implications have been assessed for the situation by years 2025, 2055 and 2105, again to provide a nationally consistent picture. *Broad estimates* of potential residential and commercial losses have been included.

5.2.1 Policy units

Statements are provided for the following Policy Units:

6.01 Kelling Hard to Sheringham	*6.09 Mundesley to Bacton Gas Terminal*	*6.17 Great Yarmouth*
6.02 Sheringham	*6.10 Bacton Gas Terminal*	*6.18 Gorleston*
6.03 Sheringham to Cromer	*6.11 Bacton, Walcott and Ostend*	*6.19 Gorleston to Hopton*
6.04 Cromer	*6.12 Ostend to Eccles*	*6.20 Hopton*
6.05 Cromer to Overstrand	*6.13 Eccles to Winterton Beach Road*	*6.21 Hopton to Corton*
6.06 Overstrand	*6.14 Winterton to Scratby*	*6.22 Corton*
6.07 Overstrand to Mundesley	*6.15 California to Caister-on-Sea*	*6.23 Corton to Lowestoft*
6.08 Mundesley	*6.16 Caister-on-Sea*	*6.24 Lowestoft North (to Ness*

Point)

The policy units that were used in the original SMP that was produced in 1996 were slightly different to those that are presented above. Table 1 below presents a comparison between the original policy units and those that have been used for this revision of the SMP. There are many reasons why policies, or indeed unit boundaries, have changed. These include, *inter alia*, a reassessment of data since the first SMP in 1996 and the factoring in of sea level rise.

Table 1: Comparison of the policy units from the original SMP in 1996 and those which are used in this revision.

1996 Management Unit	Policy	2006 Policy Unit	Policy option From Present Day	Policy option - Medium Term	Policy option - Long Term
N/A	N/A	6.01 – Kelling to Sheringham	No Active Intervention	No Active Intervention	No Active Intervention
RUN1	Hold	6.02 – Sheringham	Hold	Hold	Hold
RUN2	Managed Retreat	6.03 – Sheringham to Cromer	Managed Realignment	No Active Intervention	No Active Intervention
RUN3	Hold	6.04 - Cromer	Hold	Hold	Hold
TRI1	Do Nothing	6.05 – Cromer to Overstrand	Managed Realignment	No Active Intervention	No Active Intervention
TRI2	Hold	6.06 - Overstrand	Hold	Managed Realignment	Managed Realignment
TRI3	Do Nothing	6.07 – Overstrand to Mundesley	Managed Realignment	No Active Intervention	No Active Intervention
TRI4	Hold				
TRI5	Managed Retreat				

TRI6	Hold	6.08 - Mundesley	Hold	Hold	Managed Realignment
BAC1	Do Nothing	6.09 – Mundesley to Bacton Gas Terminal	Managed Realignment	No Active Intervention	No Active Intervention
BAC2	Hold	6.10 – Bacton Gas Terminal	Hold	Hold	Hold
		6.11 – Bacton, Walcott and Ostend	Hold	Managed Realignment	Managed Realignment
SEA1	Managed Retreat	6.12 – Ostend to Eccles	Managed Realignment	Managed Realignment	Managed Realignment
SEA2 (Happisburgh to Cart Gap)	Hold				
SEA3 (Cart Gap to Winterton	Hold	6.13 – Eccles to Winterton Beach Road	Hold	Hold	Conditional Hold
WIN1	Hold				
WIN2	Do Nothing	6.14 – Winterton to Scratby	Managed Realignment	Managed Realignment	Managed Realignment
CAI1	Hold				
CAI2 (Newport to mid Scratby)	Hold				

CAI2 (mid Scratby to north Caister)	Hold	6.15 – California to Caister-on-Sea	Hold	Hold/Managed Realignment	Managed Realignment
CAI2 (Caister)	Hold	6.16 – Caister-on-Sea	Hold	Hold	Managed Realignment
CAI3	Do Nothing	6.17 – Great Yarmouth	Hold	Hold	Hold
GYA1	Do Nothing				
GYA2	Hold				
COR1	Hold	6.18 - Gorleston	Hold	Hold	Hold
COR2	Managed Retreat	6.19 – Gorleston to Hopton	Managed Realignment	No Active Intervention	No Active Intervention
COR3	Hold	6.20 - Hopton	Hold	Managed Realignment	Managed Realignment
COR4	Managed Retreat	6.21 – Hopton to Corton	Managed Realignment	Managed Realignment	No Active Intervention
COR5	Hold	6.22 - Corton	Hold	Managed Realignment	Managed Realignment
COR6 (south Corton to Gunton Cliffs	Do Nothing				

COR6 (Gunton Cliffs to Gunton Denes)	Do Nothing	6.23 – Corton to Lowestoft	Managed Realignment	No Active Intervention	No Active Intervention
COR7	Hold	6.24 – Lowestoft North (to Ness Point)	Hold	Hold	Hold

Location reference:	***Kelling Hard to Sheringham***
Policy Unit reference:	6.01

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

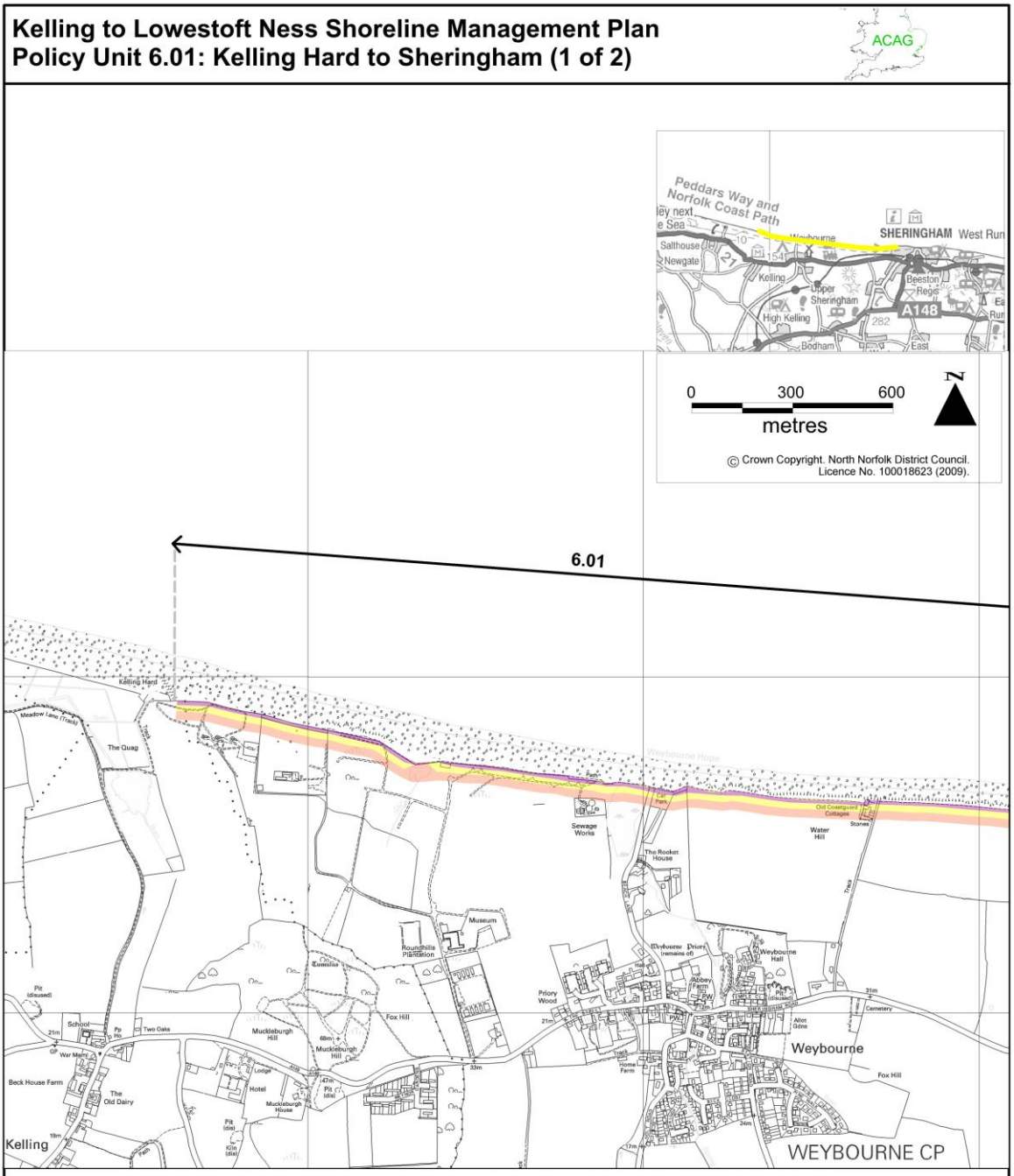
Plan:

The long-term Plan is to promote a naturally-functioning coastline, with minimal human interference. This will allow beach material to be replenished through cliff erosion and sediment to move freely along the coast, feeding the shingle ridge to the west. There are no existing open coast defences and few socio-economic assets along the frontage that would generate justification for defence construction; therefore this long-term Plan to retreat can be implemented immediately.

Policies to implement Plan:

From present day:	The policy option from the present day is to allow natural processes to take place, i.e. allow coastal retreat through a policy of no active intervention on the open coast. There is a short length of palisade at Weybourne to prevent breach of the shingle ridge. As the shingle ridge rolls back this will become exposed and local flood defence works could be implemented in a set back position to maintain facilities and reduce flood risk at this location. The flood defences would not impact upon coastal processes, however any works would need to be economically justified. This policy option will enable a naturally-functioning coastline to operate. There will however be a loss of some cliff top land, which includes agricultural land and part of the golf course.
Medium-term:	No change in policy option, from no active intervention, is proposed.
Long-term:	No change in policy option, from no active intervention, is proposed.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.01: Kelling Hard to Sheringham (1 of 2)



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.01: Kelling Hard to Sheringham (2 of 2)

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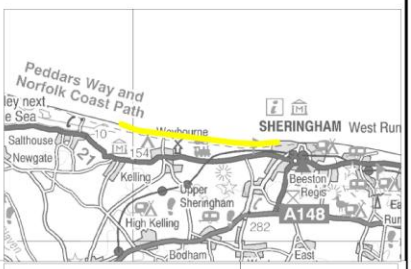

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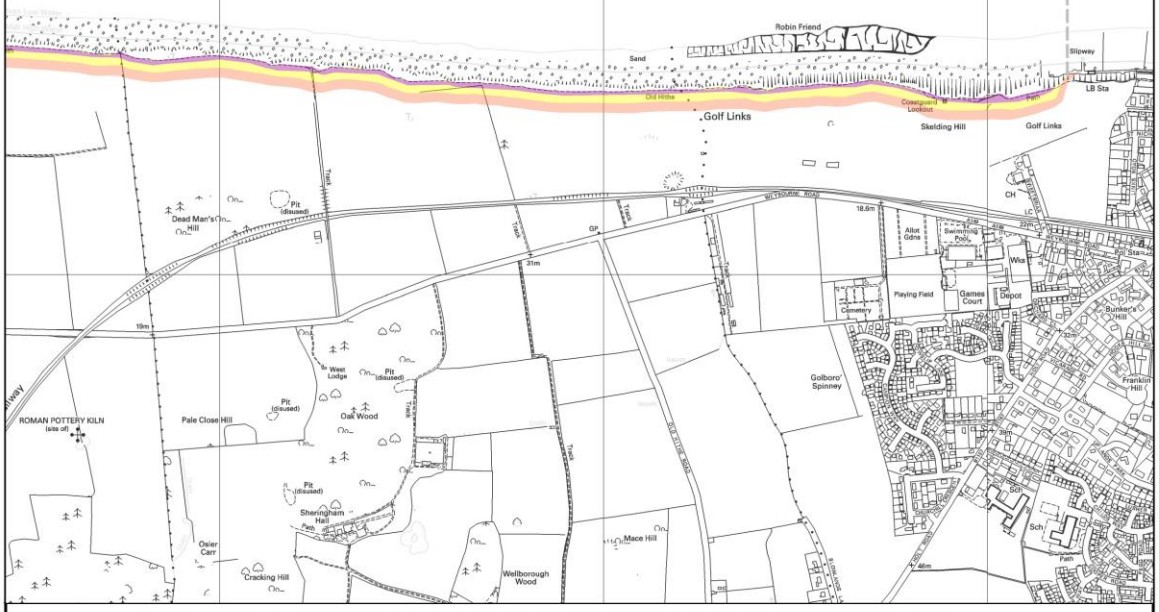


FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Kelling Hard to Sheringham***
Policy Unit reference:	6.01

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of no houses. Loss of agricultural land. Loss of the coastal strip of Sheringham Golf Links.	Naturally-functioning coast. Continued exposure of Weybourne cliffs SSSI. Some loss in area of Kelling Hard CWS and Beach Lane CWS, but status should remain.	AONB landscape quality maintained.	Loss of some coastal monument sites, including some of high importance.	Beach maintained. Car park and beach access remain. Coastal path would require relocation.
By 2055	Loss of less than 5 houses. Further loss of agricultural land. Further loss of Sheringham Golf Links.	Naturally-functioning coast. Continued exposure of Weybourne cliffs SSSI. Further loss in area of Kelling Hard CWS and Beach Lane CWS, but status should remain.	AONB landscape quality maintained.	Further loss of some coastal monument sites, including some of high importance.	Beach maintained. Partial loss of present car park and beach access would need to be relocated.
By 2105	Cumulative loss of less than 5 houses. Further loss of agricultural land. Further loss of Sheringham Golf Links.	Naturally-functioning coast. Continued exposure of Weybourne cliffs SSSI. Further loss in area of Kelling Hard CWS and Beach Lane CWS, but status should remain.	AONB landscape quality maintained.	Further loss of some coastal monument sites, including some of high importance.	Beach maintained.

Location reference:	***Sheringham***
Policy Unit reference:	6.02

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The long-term Plan for Sheringham is to continue to protect assets within the town through defending the present position, although it is recognised that this will reduce the exposure of the Beeston Cliffs SSSI, and hence the value of the site. This is technically sustainable due to low sediment transport rates, which means that there would be limited impact upon adjacent shorelines. The town is also a key service centre for the region, providing a range of facilities that support surrounding communities.

Policies to implement Plan:

From present day:

The policy option from the present day is to hold the existing line and continue to defend assets within the town through maintaining (and if necessary extending) existing structures, i.e. seawalls and groynes. This policy option will, however, inhibit cliff erosion along the frontage, which will be detrimental to a section of the Beeston cliffs SSSI, which requires geological exposure. Mitigation measures will therefore need to be investigated.

This approach is consistent with the long-term Plan for this section of shoreline.

Medium-term:

The medium-term policy option is to continue defending the frontage beyond the short term through a hold the line policy. Defence of this frontage would most likely be provided through maintaining, replacing and, if necessary, upgrading seawall structures. It is likely that defences would need to be extended to the east to provide protection to property, further covering the Beeston cliffs SSSI.

During the next 20 to 50 years, it is likely that a beach would remain along the front as long as the groynes are maintained and replaced, although their effectiveness will gradually reduce as sea levels rise and erosion to the east and west of the town continues to set back the shoreline either side. At some point in the medium to long-term these groynes will become redundant as it will probably no longer be possible to hold a stable beach in front of the town.

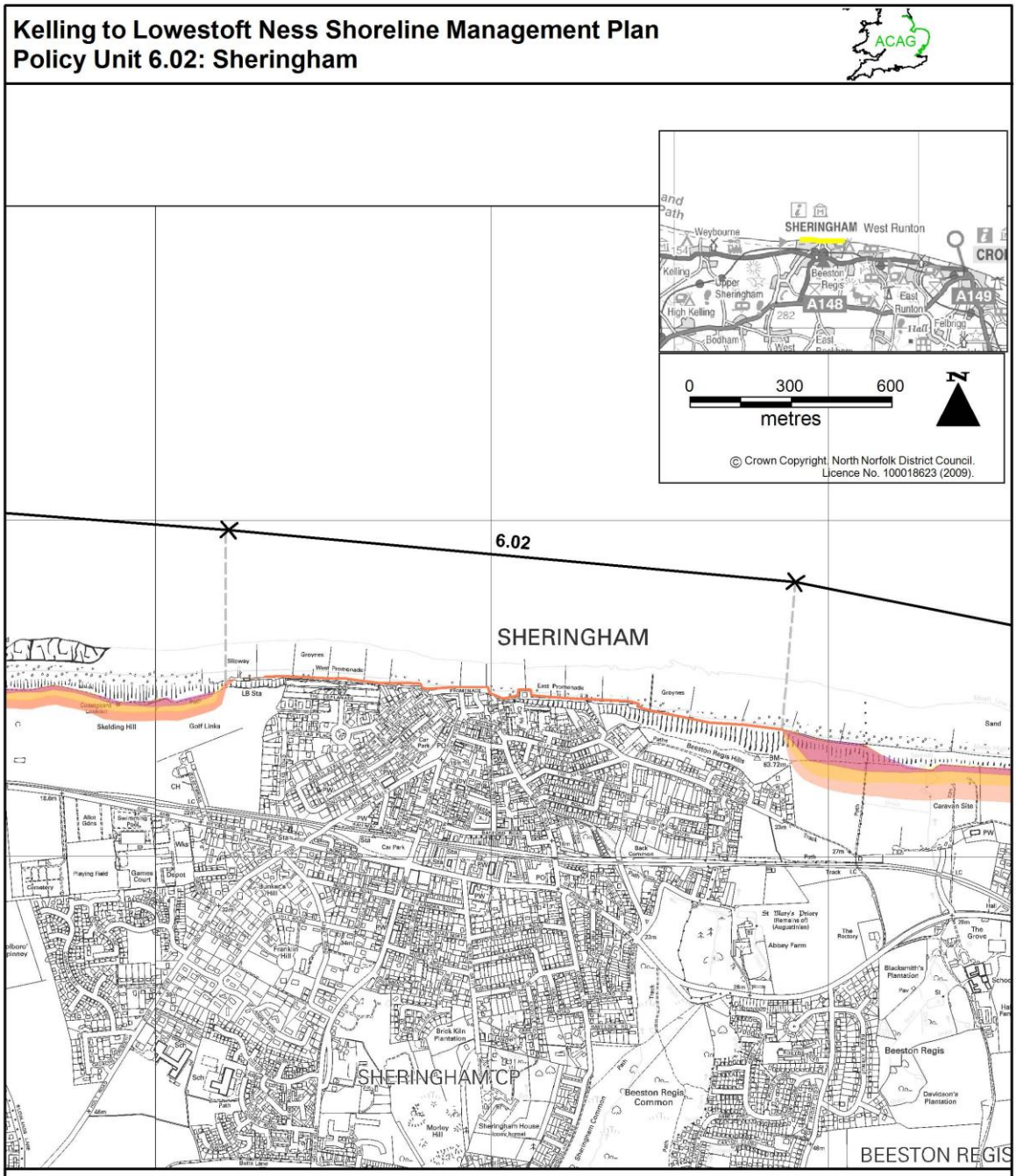
Long-term:

Due to the socio-economic assets along this frontage, the long-term policy option is to continue defending the frontage through a hold the line policy. Protection would most likely be provided through maintaining, replacing and upgrading seawall structures. Due to the frontage developing as a promontory, it will become increasingly exposed and beaches are likely to disappear altogether in the long-term, the groynes having become ineffective, ultimately changing the character of the resort. Without a beach it will also become increasingly expensive to maintain defences along this frontage and although this policy option is considered sustainable for the timescales

discussed, in the very long-term (i.e. much greater than 100 years) it is recognised that this may become difficult to continue to justify economically.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.02: Sheringham



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Location reference:	***Sheringham***
Policy Unit reference:	6.02

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	No loss of property or land behind the existing defences.	Poor exposure of approximately 50% of Beeston Regis SSSI, but preservation of cliff top grassland.	No change to landscape character of seafront.	No loss of heritage sites landward of defences.	No loss of community or recreational facilities landward of defences, including National Trail. Narrow beach retained.
By 2055	No loss of property or land behind the existing defences.	Poor exposure of approximately 50% of Beeston Regis SSSI, but preservation of cliff top grassland.	Landscape character of seafront may change due to greater defence works.	No loss of heritage sites landward of defences.	No loss of community or recreational facilities landward of defences, including National Trail. Little or no beach.
By 2105	No loss of property or land behind the existing defences. Properties along the promenade may become more exposed and subject to overtopping and storm damage.	Poor exposure of approximately 50% of Beeston Regis SSSI, but preservation of cliff top grassland.	Landscape character of seafront may change due to greater defence works, also beach lost.	No loss of heritage sites landward of defences.	No loss of community or recreational facilities landward of defences, including National Trail. Beach lost. Lifeboat Station at increased risk of being damaged, but slipway likely to remain functional.

Location reference:	***Sheringham to Cromer***
Policy Unit reference:	6.03

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

This area includes nationally important SSSI sites, designated for their geological exposures. The long-term Plan for this length is to allow it to retreat, enabling a naturally-functioning coastal system, with minimal human interference. This will maintain environmental interests and provide continued sediment supply to beaches locally. The immediate cliff top area is mainly undeveloped and the land is predominately used for agricultural purposes, but caravan parks are potentially at risk together with a few properties at East Runton.

Policies to implement Plan:

From present day: The policy option is to allow shoreline retreat through managed realignment. This will entail making defunct defences safe and maintaining the two access points at East and West Runton Gaps, which are locally important. Other than this there will be no intervention to stop natural processes.

At the Gaps it is therefore proposed to maintain the defences to enable continued access to the beach. This policy option will fulfil environmental objectives, although it will also result in loss of agricultural and holiday camp land.

This is not detrimental to the long-term Plan for this section of shoreline, due to the limited stretch and short term life of these structures.

Medium-term: Due to outflanking as cliffs erode to either side, it will become difficult to continue to maintain the access points at East and West Runton Gaps, therefore a no active intervention policy option is to be adopted once these defences reach the end of their effective life. This will allow the natural functioning of the coast and maintain the geological exposures of the cliffs and foreshore.

Long-term: To ensure the input of sediment to the SMP coastline, as a whole, the long-term policy option is for no active intervention. Other options are not likely to become economically viable, as the villages of East Runton and West Runton are unlikely to become threatened by erosion until beyond the next 100 years, although isolated properties may be lost during this period.

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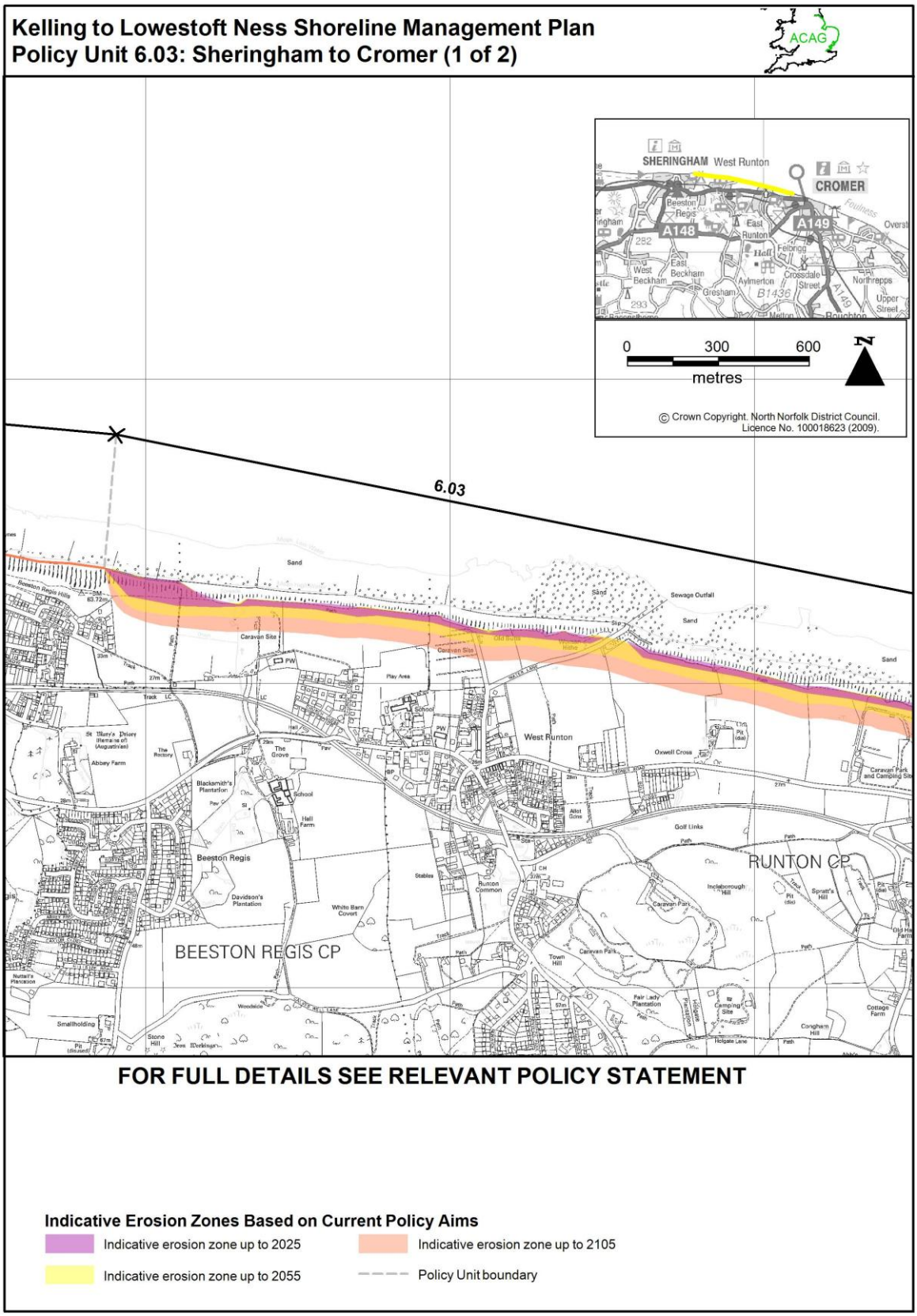

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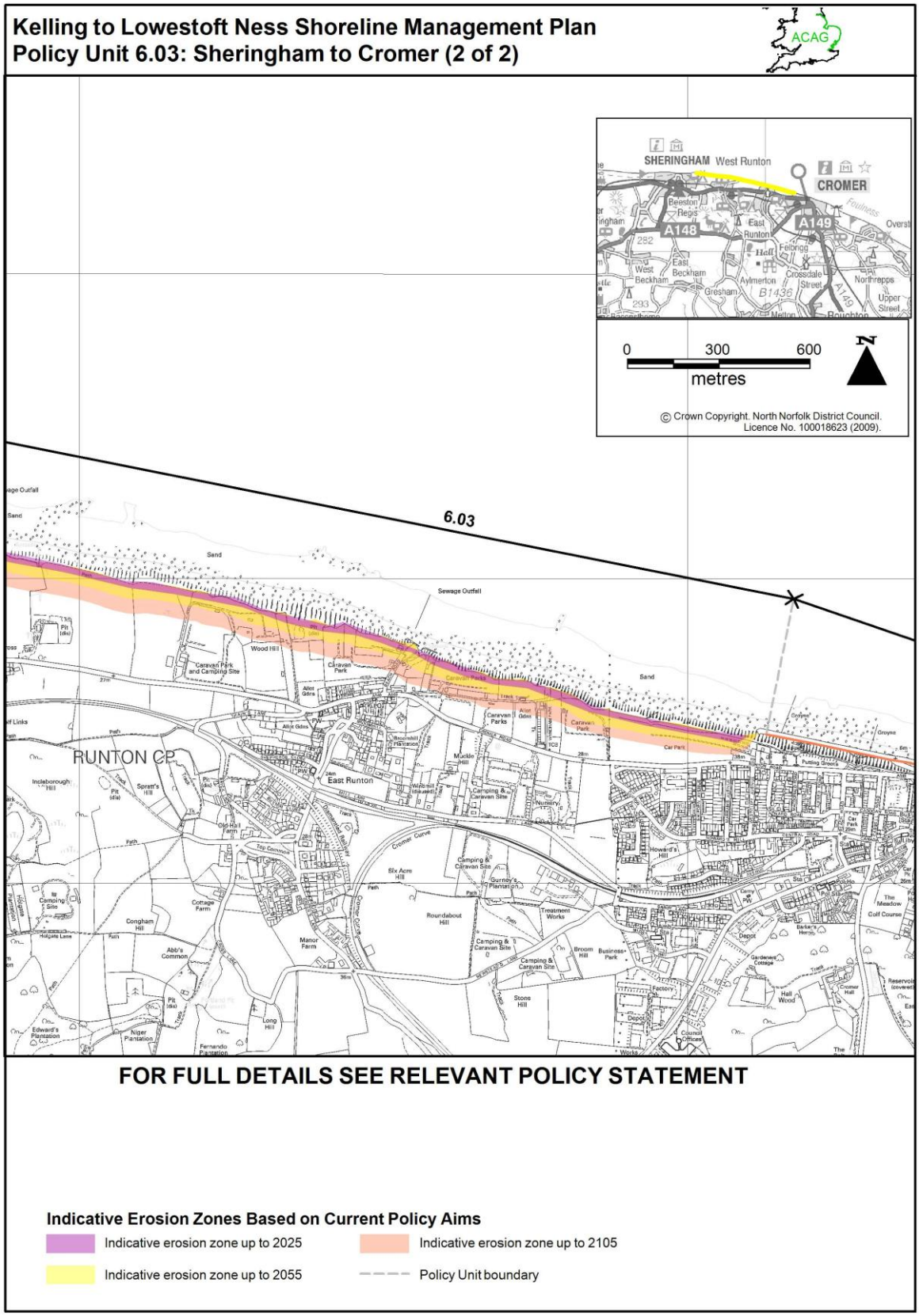
Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.03: Sheringham to Cromer (2 of 2)



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Location reference:	***Sheringham to Cromer***
Policy Unit reference:	6.03

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of seafront land, but not properties. Some loss of caravan park land. Loss of Grade 3 agricultural land.	Naturally-functioning coast. Continued exposure of West Runton SSSI and East Runton cliffs SSSI and foreshore SSSI, apart from locally at Gaps.	No landscape objectives identified.	No loss of sites designated as high importance.	Access points and car parks maintained. Beach maintained.
By 2055	Loss of less than 5 commercial properties in East Runton and associated services. Further loss of caravan park land. Further loss of Grade 3 agricultural land.	Naturally-functioning coast. Continued exposure of West Runton SSSI and East Runton cliffs SSSI; improved at Gaps.	No landscape objectives identified.	Loss of one site, noted as high importance.	Loss of existing accesses and car parks. New accesses could be created as funding permits. Beach maintained.
By 2105	Cumulative loss of less than 10 houses and 10 commercial properties and associated services. Further loss of caravan park land. Cumulative loss of up to approximately 45 hectares of Grade 3 agricultural land.	Naturally-functioning coast. Continued exposure of West Runton SSSI and East Runton cliffs SSSI.	No landscape objectives identified.	No further loss of sites designated as high importance.	Beach maintained, but existing access not present. New accesses could be created as funding permits.

Location reference:	***Cromer***
Policy Unit reference:	6.04

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The recommended long-term Plan for Cromer is to continue to protect assets within the town through defending the present position. This is technically sustainable due to relatively low sediment transport rates and therefore limited impact upon adjacent shorelines. The town is a key service centre for the region, providing a range of facilities that support surrounding communities.

Policies to implement Plan:

From present day: The policy option from the present day for this area is to continue to hold the existing line to protect the town frontage through maintaining, and if necessary replacing, existing defences, i.e. the seawalls and groynes.

This is consistent with the long-term Plan for this section of shoreline.

Medium-term: The medium-term policy option is to continue to defend the frontage beyond the short term through a hold the line policy. Defence of this frontage would most likely be provided through maintaining, replacing and upgrading seawall structures.

During the next 20 to 50 years, it is likely that a beach would remain along the front as long as the groynes are maintained and replaced, although their effectiveness will gradually reduce as sea levels rise and erosion to the east and west of the town continues to set back the shoreline either side. At some point (in the long-term) these groynes will become redundant as it will probably no longer be possible to hold a stable beach in front of the town.

Long-term: The long-term policy option is to continue defending the frontage through a hold the line policy. Defence of this frontage would most likely be provided through maintaining, replacing and upgrading seawall structures.

Although this will continue to protect assets within the town, the character of the frontage will change from the present day, as this coastline becomes a significant promontory over time and it is unlikely that a beach would exist along the town frontage. Without a beach it will also become increasingly expensive to maintain defences along this frontage and although this policy option is considered sustainable for the timescales discussed, in the very long-term (i.e. much greater than 100 years) it is recognised that this may become difficult to continue to justify economically.

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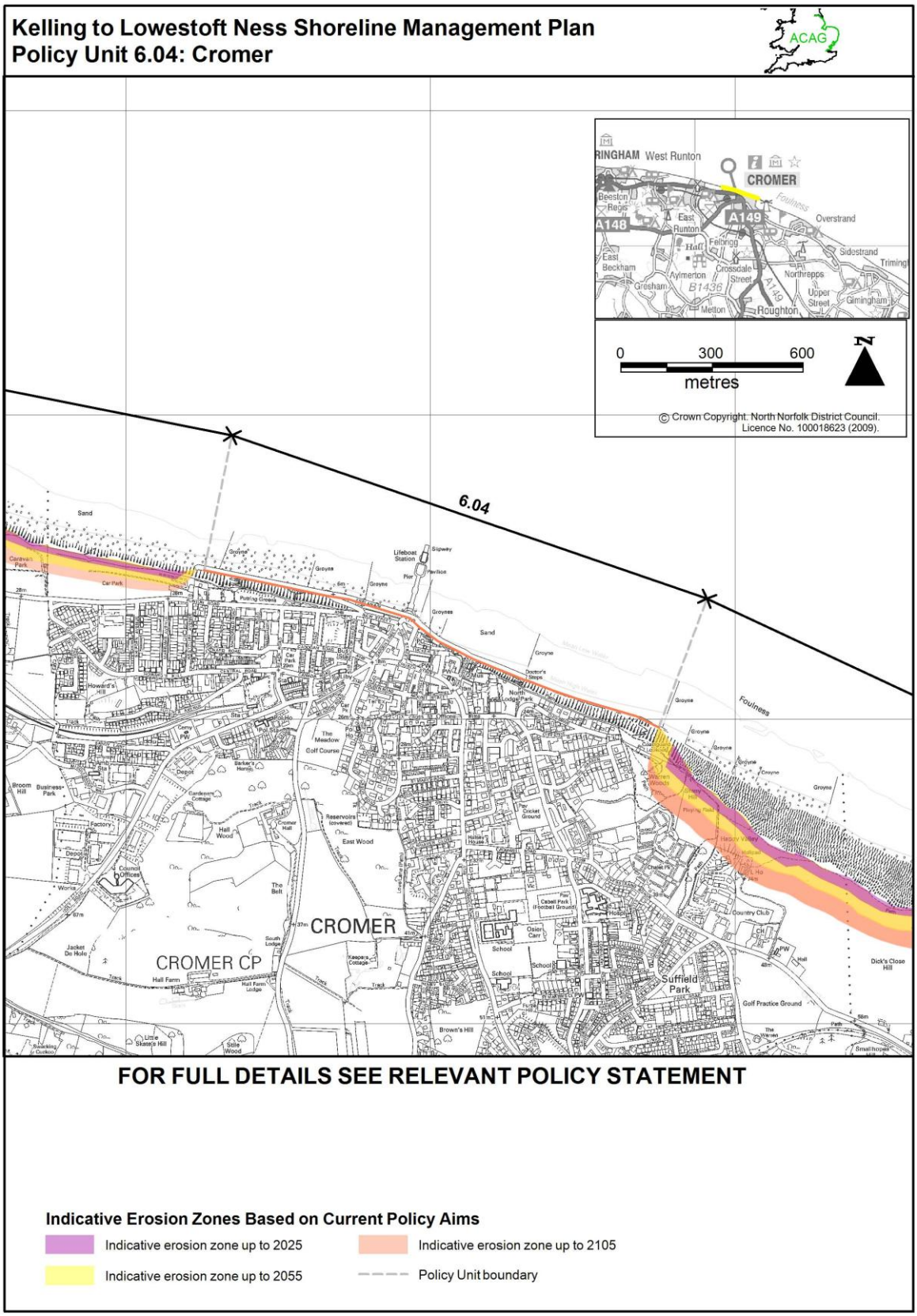

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Location reference:	***Cromer***
Policy Unit reference:	6.04

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	No loss of property or land behind the existing defences.	No variance	No change to landscape character of seafront.	No loss of heritage sites landward of defences.	No loss of community or recreational facilities landward of defences. Narrow beach retained.
By 2055	No loss of property or land behind the existing defences. Properties along the promenade may become more exposed and subject to overtopping and storm damage.	No variance	Landscape character of seafront may change due to greater defence works.	No loss of heritage sites landward of defences. Structural integrity of Grade II Cromer Pier possibly threatened. Structural integrity of Grade II Cromer sea wall threatened.	No loss of community or recreational facilities landward of defences. Little or no beach. Lifeboat Station may need to be relocated.
By 2105	No loss of property or land behind the existing defences. Properties along the promenade may become more exposed and subject to overtopping and storm damage.	No variance	Landscape character of seafront may change due to greater defence works, also beach lost.	No loss of heritage sites landward of defences. Structural integrity of Grade II Cromer Pier threatened. Structural integrity of Grade II Cromer sea wall threatened.	No loss of community or recreational facilities landward of defences. Beach lost. Lifeboat Station may need to be relocated.

Location reference:	***Cromer to Overstrand***
Policy Unit reference:	6.05

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The cliffs along this length of shoreline provide a vital sediment source for much of the SMP frontage. Therefore maintaining this sediment input is a key aim for the region as a whole. There are also few socio-economic assets at risk along this cliff-top; therefore there is no economic justification for investment in defences along this frontage. Coupled with this is the fact that the cliffs are designated at a European level, for their conservation importance which is partly maintained by the progressive erosion which exposes areas of the cliff and then allows successional cycles of plant communities, which provide much of the botanical value, and hence would be maintained by allowing erosion to continue. Although it will be important to ensure that the defences at Cromer are not outflanked, the long-term Plan for this area is to allow it to retreat.

Policies to implement Plan:

From present day:

The policy option is to allow retreat through, but through managed realignment to allow defence ruins to be removed. There would no longer be any maintenance of the existing timber groynes and revetments. Where they exist, these defences have a life of between 5 and 10 years, so during this period they will still have some effect on slowing natural cliff erosion.

This policy option will increase the volume of sediment provided to build beaches throughout the SMP area, maintain the geological exposures of the cliffs and foreshore and be in keeping with the AONB and SAC designations. There will, however, be loss of golf course land and the coastal path would need to be relocated.

Medium-term

Once defences fail, in the medium-term the policy option is no active intervention to ensure a sediment supply to this, and importantly, downdrift frontages. The lack of cliff-top development here also means there is little economic justification for significant investment in defences along this frontage.

Measures will need to be identified in the medium-term to help minimise the impact on the lives of individuals and communities in the long term, particularly for the community living in the eastern end of Cromer. Works to defend the coast are unlikely to be justifiable or consented. As there will be no holding measures it is vital that social mitigation measures are fully developed before the few properties at risk are directly affected.

Long-term:

In the long-term, the policy option is for no active intervention to ensure a sediment supply to this, and importantly, downdrift frontages.

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Between years 50 and 100, a small number of properties at the far eastern end of Cromer might become at risk.

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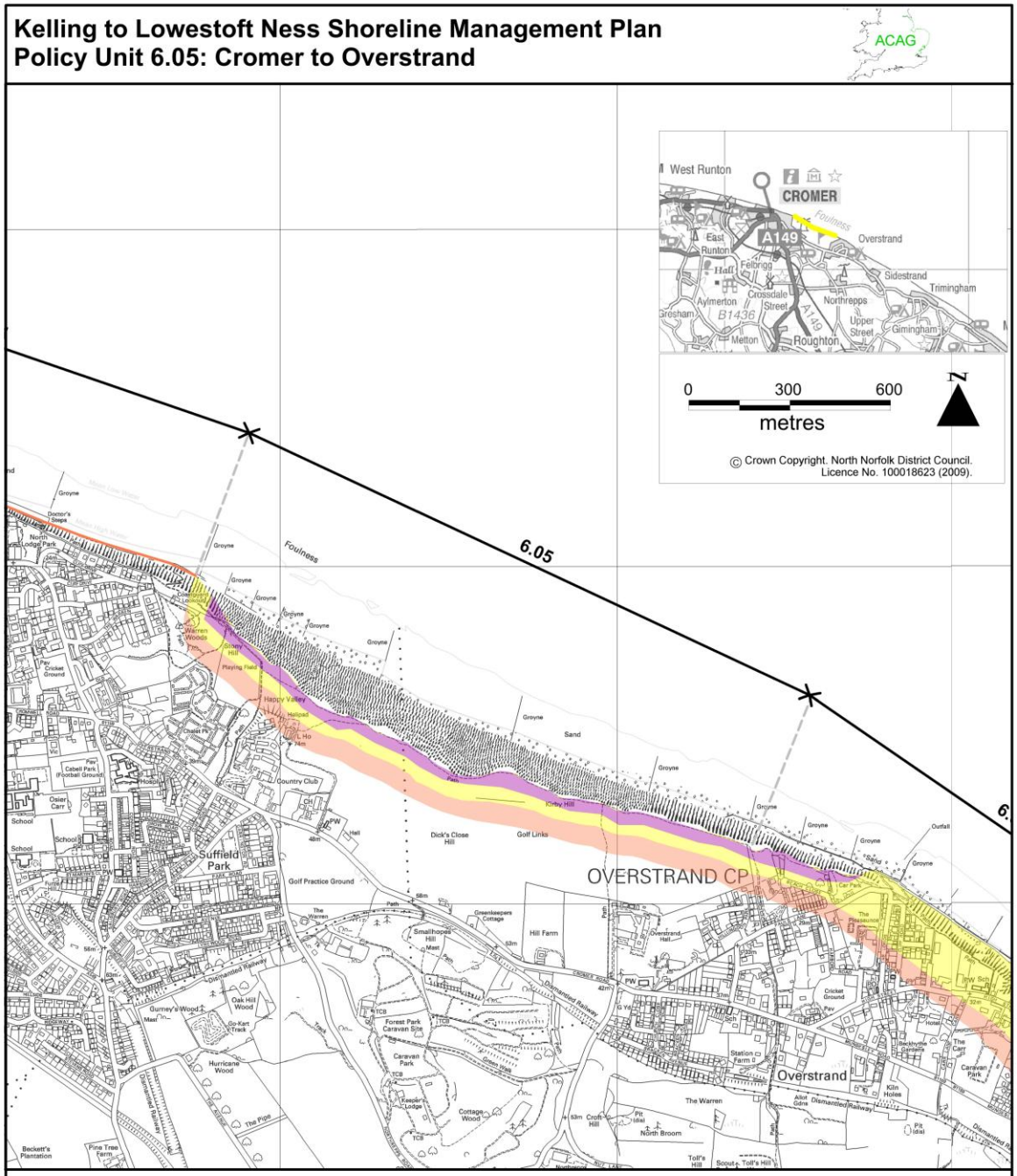
Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.05: Cromer to Overstrand



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

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Location reference:	***Cromer to Overstrand***
Policy Unit reference:	6.05

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Continued loss of coastal strip of golf course.	Naturally-functioning coast. Cliffs, designated as SAC, allowed to evolve naturally.	AONB landscape quality maintained.	No historic objectives identified.	Beach present. Paston footpath will need to be rerouted.
By 2055	Further loss of golf course.	Naturally-functioning coast. Cliffs, designated as SAC, allowed to evolve naturally.	AONB landscape quality maintained.	No historic objectives identified.	Beach present. Paston footpath will need to be rerouted.
By 2105	Further loss of golf course. Loss of less than 5 commercial properties.	Naturally-functioning coast. Cliffs, designated as SAC, allowed to evolve naturally.	AONB landscape quality maintained.	No historic objectives identified.	Beach present. Paston footpath will need to be rerouted.

Location reference:	***Overstrand***
Policy Unit reference:	6.06

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The whole length of cliffs between Cromer and Mundesley provide a vital source of beach sediment area for much of the SMP frontage. Therefore maintaining this sediment input and transport along the coast is a key long-term aim. However, historic defence construction at Overstrand has already formed a significant promontory, and this will have an increasing influence on the sediment drift to downcoast beaches if the present define line is maintained, preventing approximately 20% of the entire SMP beach sediment budget from moving freely along the coast. Furthermore, there is not, at present, sufficient economic justification for new defences. Consequently, the long-term aim for this frontage is to allow the shoreline to retreat. However, there are a large number of socio-economic assets, which will be at risk under this approach. Therefore in the immediate future defences will be maintained as long as possible within existing economic justification, whilst measures are put in place, to manage this risk and mitigate the displacement of people and loss of property and facilities, in the medium-term.

Policies to implement Plan:

From present day: The policy option for the next twenty years is to continue to protect the village frontage through *initially* undertaking regular maintenance of the existing defences and repairing them when areas are damaged, where it is economical to do so. This is a hold the line policy option.

In parallel, however, investigations will be undertaken to identify technical options and establish an appropriate package of social mitigation measures, in preparation for the transition to the medium to long term policy option of managed realignment (see sections below). Only when such adequate mitigating social measures are identified to limit the impact on the lives of individuals and the community, would the change to a managed realignment policy option be implemented.

Should a more major failure of the existing defences occur, which could be within the next 20 years, the seawall would not be rebuilt as a permanent structure, However, wherever practicable, temporary structures that assist in delaying the erosion would be used (for example local placement of rock, beach recharge etc) to delay further damage whilst approaches to manage and mitigate losses are developed.

Overstrand already forms a promontory, and this will become more evident over this period as cliffs to either side erode. This will begin to restrict sediment from the north reaching beaches to the south, and may also cause a net loss from the system as sediment is moved offshore more rapidly.

Over this period, beaches will continue to become narrower and defences more exposed. The cliffs are inherently unstable and prone to failure through groundwater percolation; therefore those areas protected by only timber revetment will still be at risk of erosion. However, the extent of erosion is not predicted to result in the loss of properties during this period.

Due to the rapid response of this shoreline to erode and resume a natural position once defences are no longer in place, this shorter term policy option is not considered to be detrimental to the long-term Plan.

Medium-term:

This will be a transitional period, during which the defences will reach the end of their effective life. Once suitable mitigation measures are identified to limit the impact on the lives of individuals and the community, the coast should be allowed to retreat. This retreat will result in the loss of cliff-top properties and there may be justification for occasional intervention to help manage the retreat because of the large number of assets at risk and the need for measures to be in place to manage risk; therefore the policy option is managed realignment where the management may comprise of minor and temporary works to slow the rate of retreat. This will also allow for the removal of defence ruins, once social mitigation measures have been identified, or where temporary measures to slow erosion are landward of the old defences.

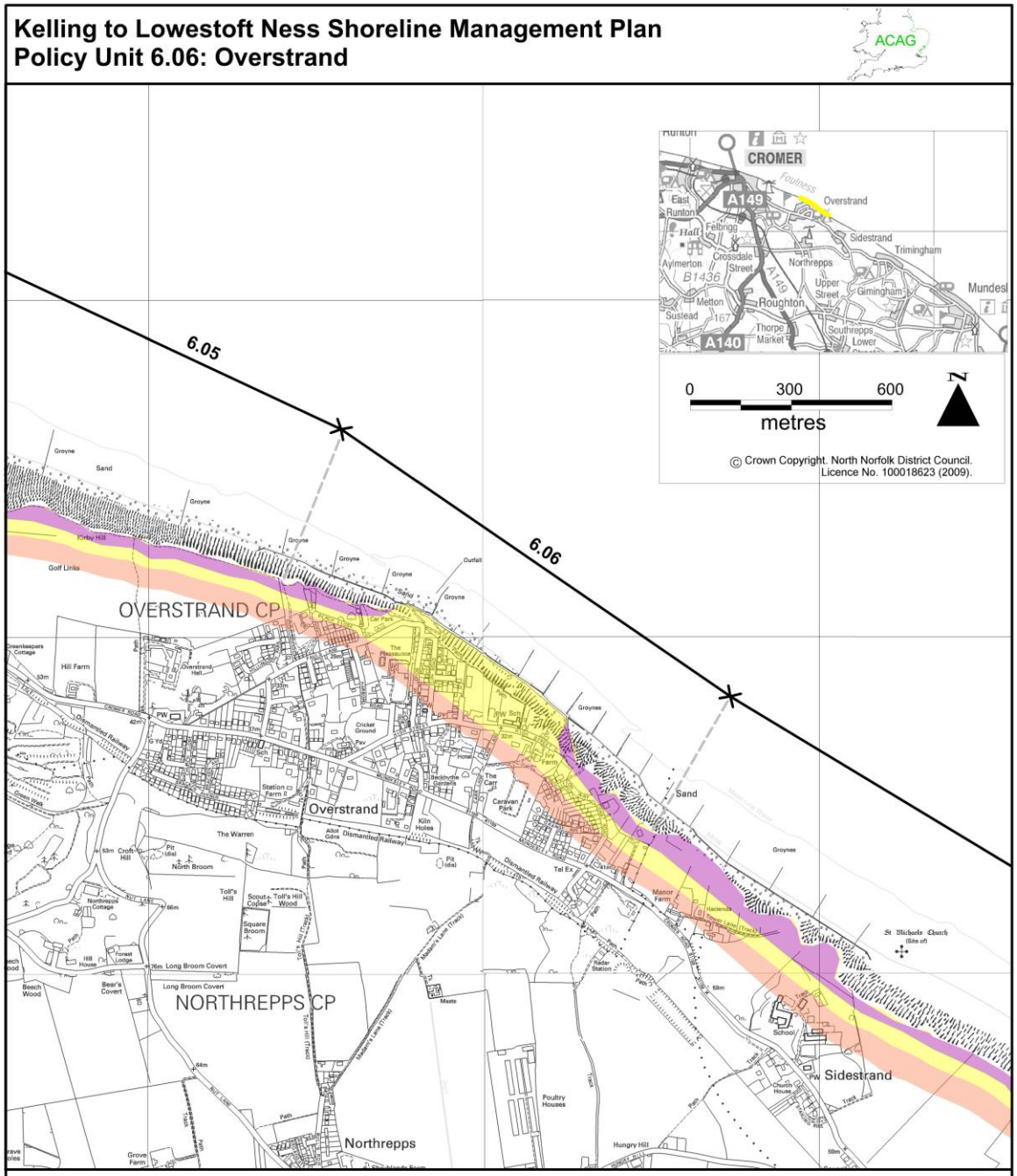
If it has not been possible to confirm acceptable social mitigation measures and/or if it can be shown that there are no long term detrimental consequences, defence measures that temporarily slow (rather than halt) erosion might be acceptable. These would need to be shown to be economically justified. It would also need to be shown that they would neither prevent the alongshore transport of beach sediment nor result in the further development of this area as a promontory, i.e. phases of retreat should be allowed for.

Long-term:

In the long-term the policy option is for retreat to ensure sediment supply to this and, importantly, downdrift frontages. This will deliver technical and environmental benefits, but a number of assets will be at risk. Therefore there needs to be a continuation of measures to manage losses, including erosion-slowing defences, and removal of defence ruins. The recommended policy option is therefore managed realignment.

Ultimately, the shoreline must be allowed to reach a point more in keeping with the natural position had it not been defended, which will then enable a beach to form. At this point it is expected that erosion rates will slow and management of the shoreline will be more easily achieved, through measures such as groynes, without being detrimental to other parts of the SMP frontage.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.06: Overstrand



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

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Location reference:	***Overstrand***
Policy Unit reference:	6.06

IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of less than 5 properties along the south of Overstrand, but also loss of gardens due to natural cliff failure behind defences.	No change from present condition.	No landscape objectives identified.	No loss of high importance heritage sites.	No loss of community facilities behind the defences, but potential loss of Jubilee Ground. Promenade maintained, but very narrow beach. Access to beach maintained. Loss of some of car park.
By 2055	Cumulative loss of between 20 and 60 houses and less than 10 commercial properties and associated infrastructure/ services. Loss of local road links. Loss of sewage pumping station.	Increased erosion may improve County Wildlife status.	No landscape objectives identified.	Loss of Grade II property: 'Sea Marge'.	Loss of promenade. Car park lost together with present access.
By 2105	Cumulative loss of between 60 and 135 houses and less than 10 commercial properties and associated infrastructure/ services. Loss of local road links. Loss of sewage pumping station.	Increased erosion may improve County Wildlife status.	No landscape objectives identified.	Loss of Grade II property: 'The Pleasance'.	Access and car park no longer present.

Location reference:	***Overstrand to Mundesley***
Policy Unit reference:	6.07

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

This frontage provides the largest source of sediment for maintaining beaches along much of the SMP frontage. This is a critical supply, without which erosion elsewhere may be accelerated, leading to more rapid loss of property. Therefore maintaining this sediment input is a key aim for the region as a whole and the proposed long-term Plan is to allow natural functioning of the coast through allowing it to retreat. Although there are socio-economic implications, such as residential and commercial properties at risk from erosion at Trimingham and along the coastal strip to the south, these are not sufficient to economically-justify building new defences along this frontage.

Policies to implement Plan:

From present day: The new policy option for the majority of this length of coast is to no longer maintain existing timber groynes and revetments and to allow coastal retreat, but to do this via managed realignment policy to allow for ruined defences to be safely removed. Where they exist, these defences generally have a life of between 5 and 10 years, so during this period they will still have an effect on slowing natural erosion.

This policy option will increase the volume of sediment provided to build beaches throughout the SMP area, maintain the geological exposures of the cliffs and foreshore. There will, however, be loss of residential properties and associated infrastructure at Trimingham, where the policy was previously to hold the line. If it is physically possible, and funding is available the line will continue to be held in the short term. Measures will need to be identified in the short term to help minimise the impact on the lives of individuals and communities in the medium and long term, for areas where the policy option has changed from hold the line to no active intervention, in particular for the community of Trimingham. Where it can be justified economically, minor works (for example local placement of areas of rock etc) may be undertaken at selected areas to slow the rate of cliff erosion, but not with a view to protecting the coast into the medium or long term. As and when a suitable package of social, economic and planning measures is identified, maintenance and minor repair of defences will cease, and the coastline will be allowed to continue its natural regression.

Medium-term: Once defences fail, in the medium-term the policy option is no active intervention. Despite properties at Trimingham and Sidestrand being affected, as well as caravan parks to the south, there is not expected to be economic justification for significant investment in defences along this frontage. This policy option is also required to ensure a sediment supply to this and downdrift frontages.

Long-term: In the long-term, the policy option is for no active intervention to ensure a

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sediment supply to this and downdrift frontages, where the material from cliff erosion is necessary to allow beaches to build. There will, however, be continued loss of cliff-top properties and associated facilities.

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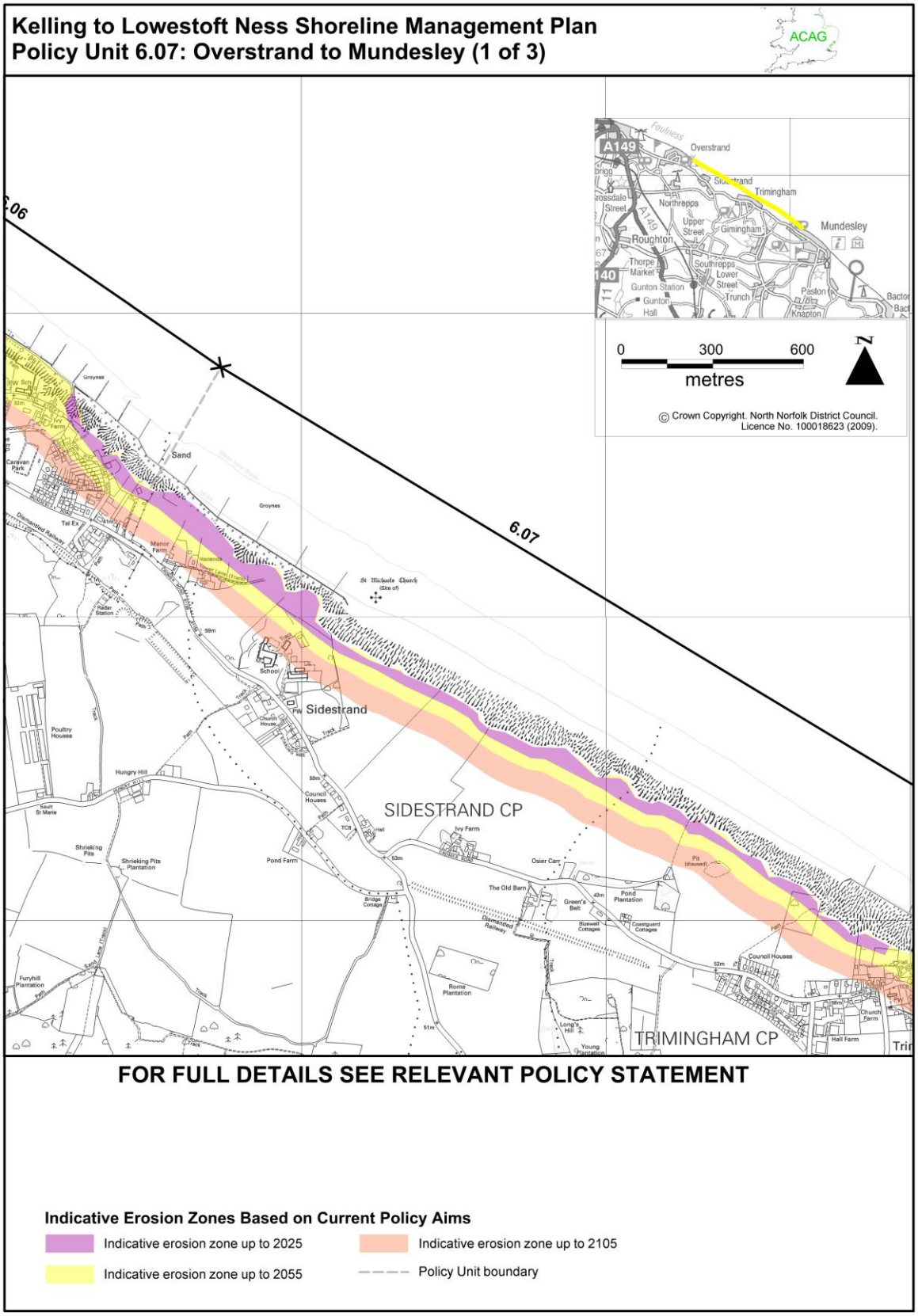

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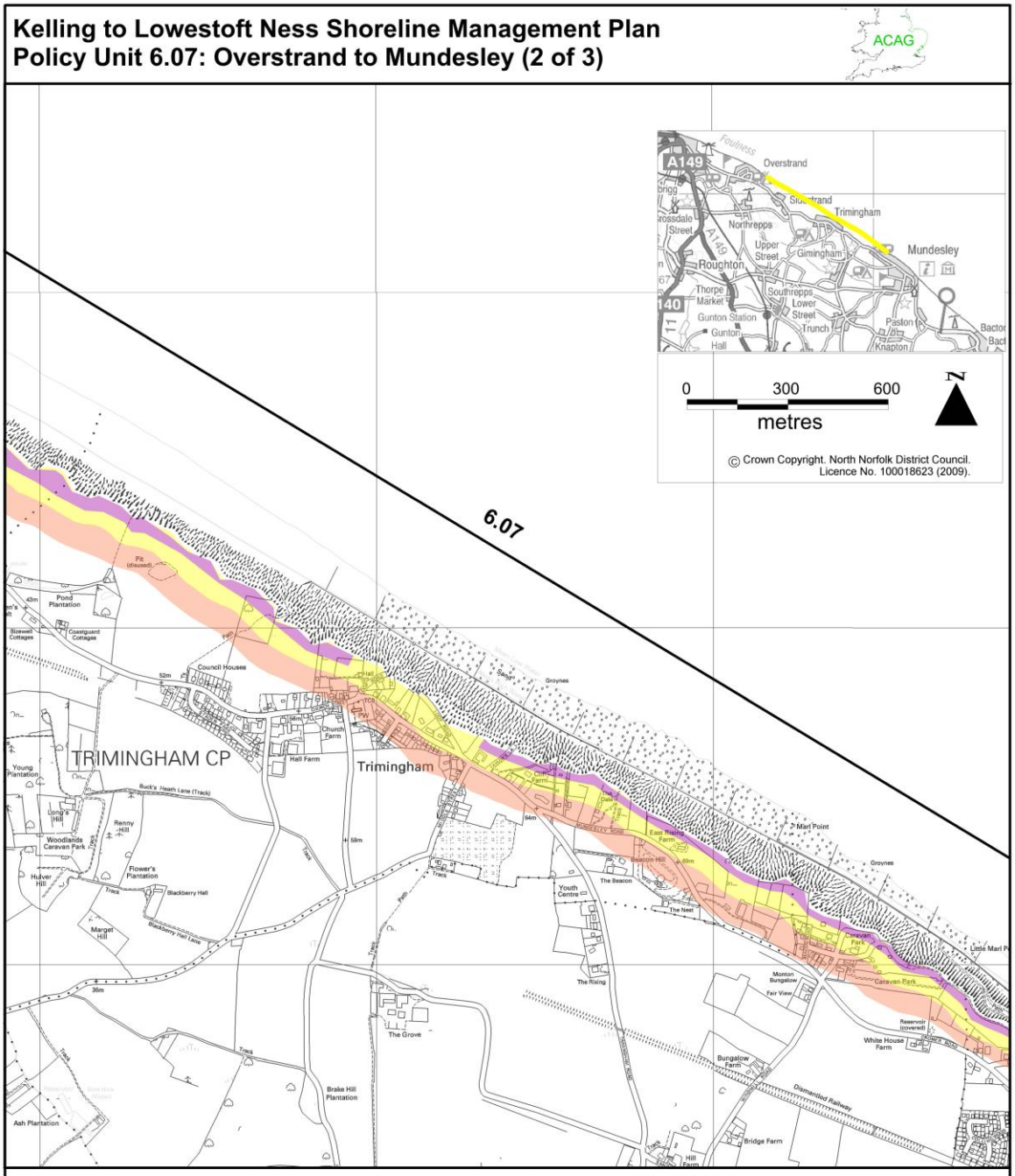
Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.07: Overstrand to Mundesley (2 of 3)



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

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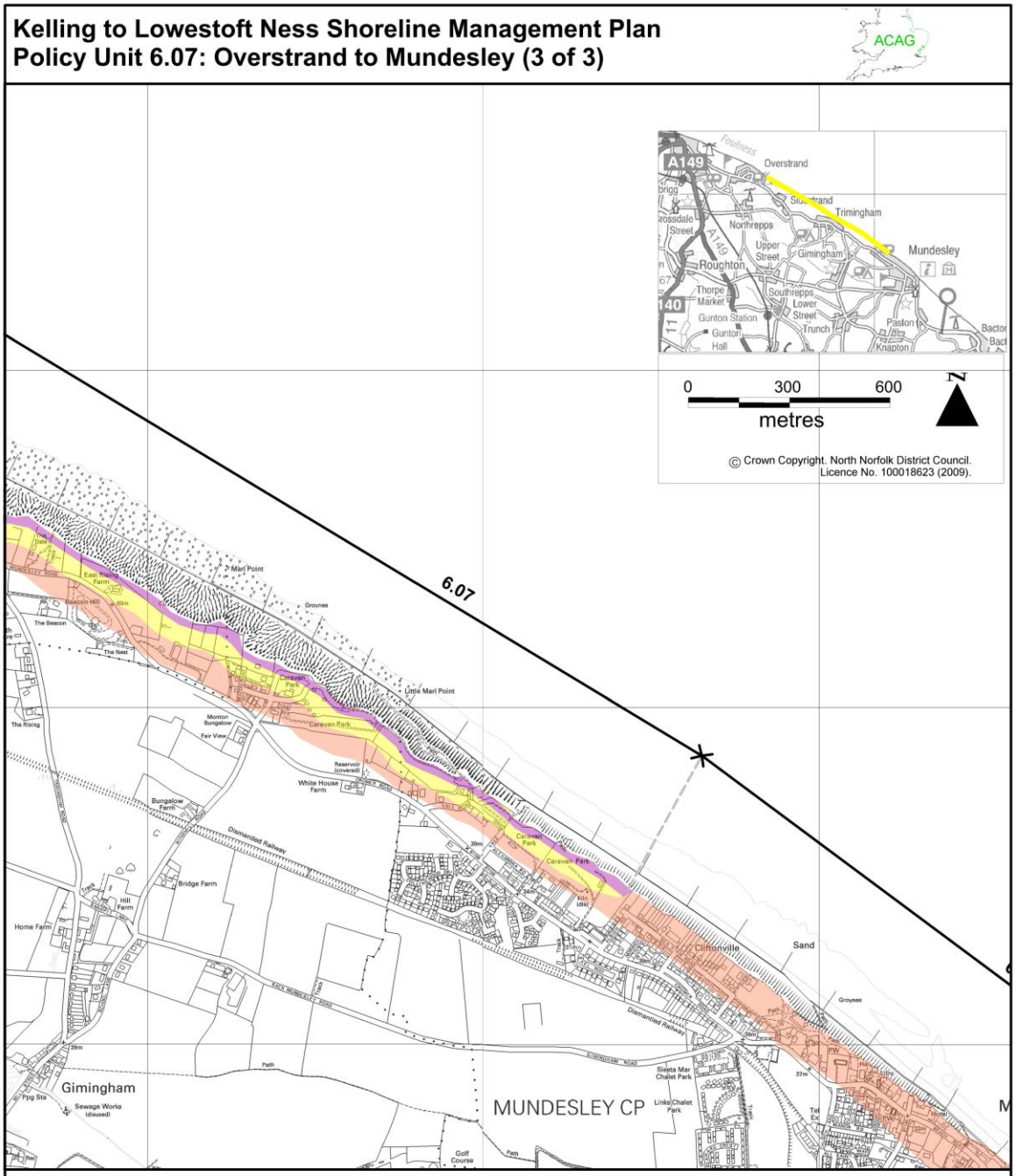
Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.07: Overstrand to Mundesley (3 of 3)



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Indicative Erosion Zones on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

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Location reference:	***Overstrand to Mundesley***
Policy Unit reference:	6.07

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of less than 10 residential and commercial properties. Loss of local roads. Loss of Grade 3 agricultural land. Loss of caravan park land.	Naturally-functioning coast. Cliffs allowed to evolve naturally, with continued exposure of geological SSSI. Possible loss of cliff top habitats – requires management.	AONB landscape quality maintained.	No heritage objectives identified.	No loss of community facilities. Beach present.
By 2055	Cumulative loss of between 10 and 30 properties (commercial and residential) in Trimingham and Sidestrand. Loss of section of main coast road linking Trimingham to adjacent towns and villages. Further loss of Grade 3 agricultural land. Loss of caravan parks.	Naturally-functioning coast. Cliffs, designated as SSSI, allowed to evolve naturally. Possible loss of cliff top habitats – requires management.	AONB landscape quality maintained.	No heritage objectives identified.	No loss of community facilities. Beach present but current access at Vale Road lost.
By 2105	Cumulative loss of between circa 30 and 90 residential properties and circa 10 to 15 commercial properties. Potential loss of MOD facility (but could be relocated) Further loss of main road linking Trimingham to adjacent towns and villages. Total loss of up to approximately 85 hectares of Grade 3 agricultural land. Loss of caravan parks.	Naturally-functioning coast. Cliffs, designated as SSSI, allowed to evolve naturally. Possible loss of cliff top habitats – requires management.	AONB landscape quality maintained.	Trimingham church lost.	Loss of Trimingham Church. Beach present but current access at Vale Road lost.

Location reference:	***Mundesley***
Policy Unit reference:	6.08

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

Although there might be justification for continuing to defend most of the property and facilities in Mundesley, this is marginal in the longer-term. However, the position of the town on the coast means that potentially it could block up to 70% of the sediment supply for the entire SMP area from reaching beaches here and downdrift if it became a headland promontory, with much of this material potentially being lost offshore. This is a critical supply, without which erosion elsewhere may be accelerated, leading to more rapid loss of property and destruction of natural habitats. Due to the significance of this, the long-term Plan is to allow the cliffs to retreat. However, it should be recognised that this long-term Plan is only viable if reciprocated at Bacton Gas Terminal.

This Plan would result in the loss of a considerable number of socio-economic assets at Mundesley and such dramatic changes will require full consideration of the practicality and cost of all alternative technical options (e.g. sediment bypassing), together with the approach, timing, and any measures that would need to be put in place to manage any risk and mitigate the displacement of people and the loss of property and assets. However, at this point in time it is anticipated that it is still some years before this area creates this major interruption to sediment supply, therefore for the immediate future the Plan is that the defences be maintained as long as is technically acceptable and economically sustainable, whilst these investigations are undertaken.

Policies to implement Plan:

From present day: The present-day policy option is to hold the line to protect assets within the town through maintaining existing defences, where this can be economically justified. This would include maintenance and any reconstruction of seawalls and groynes, and maintaining/replacing the erosion-slowing structures such as timber revetments as necessary, although reconstruction of the latter may need to be in a retreated position.

In parallel, investigations will be undertaken to identify technical options and identify an appropriate package of social mitigation measures, in preparation for the transition to the long term policy option of managed realignment (see below). Only when such adequate mitigating social measures are identified to limit the impact on the lives of individuals and the community, would a long term change to a managed realignment policy option be implemented.

This approach may become more difficult to sustain over time and may not be environmentally sustainable in the long-term due to the potential for adverse impacts on the Winterton to Horsey Dunes SAC and Great Yarmouth North Denes SPA. It is therefore recommended that detailed studies be undertaken immediately, whilst maintaining the existing defences, to fully explore the viability and implications of the alternatives that might be considered in the future, and the mechanisms that would be required to enable and manage any change. The studies included within this work will need to consider the potential impacts on habitats, what habitat would result naturally from any long term managed realignment and what opportunities there would be to compensate for future habitat losses. The findings of these studies would be considered within future reviews of the SMP policy options. Monitoring of sediment movements

down drift will be required in relation to the Winterton to Horsey Dunes SAC and Great Yarmouth North Denes SPA.

Due to the rapid response of this shoreline to erode and resume a natural position once defences are no longer in place, this shorter term policy option is not considered to be detrimental to the long-term Plan.

Medium-term:

In the medium-term, the policy option is to maintain the existing defences for as long as is technically possible, through a hold the line policy; this is expected to be beyond the next 50 years (i.e. this period). However, to comply with the long-term Plan, the policy option would be to not to replace these structures as they reach the end of their effective life even should defences begin to fail. It is probable that the groynes will fail in the medium-term and would not be replaced as they would cease to be effective as the beach narrows through natural processes.

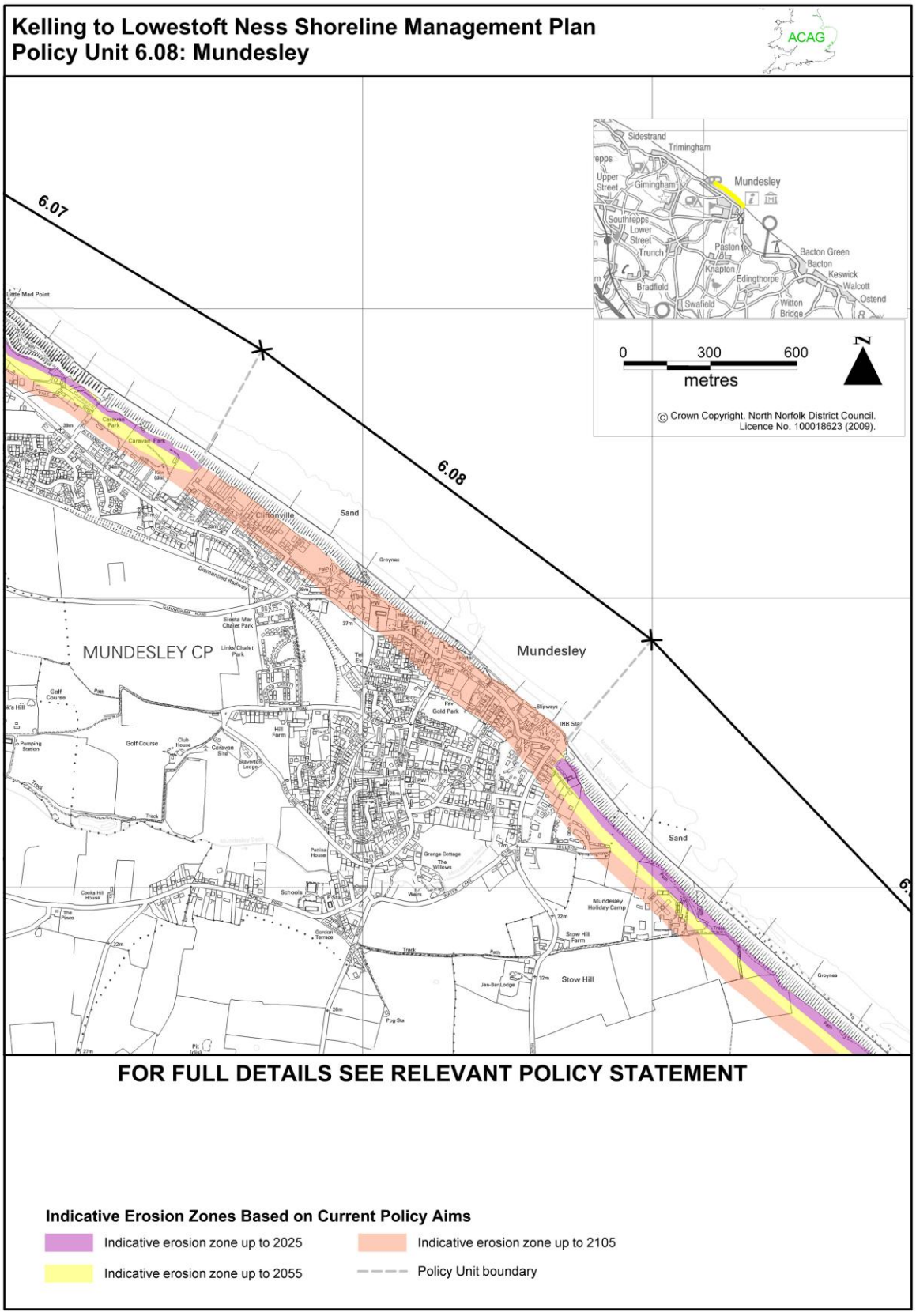
During this period measures will need to be put in place to determine how to manage the future erosion situation, both in terms of risk management and appropriate adaptation to these coastal changes by individuals and communites..

Long-term:

The long-term policy option is to allow retreat along this frontage to avoid exacerbating problems elsewhere by allowing a supply of sand to help sustain beaches downdrift. This will deliver technical and environmental benefits, but a substantial number of assets will be lost to erosion. Therefore measures to manage losses, including erosion-slowing defences, need to be implemented. Only when appropriate mitigating social measures are identified and a wider economic analysis undertaken can any change to a managed realignment policy option be considered.

To achieve the Plan the shoreline needs to reach a position generally in line with the shoreline either side. Once the shoreline attains this position, beaches should be healthier and it is likely that erosion rates will slow. As a result, management of the shoreline might be more easily achieved, through measures such as groynes, without being detrimental to other parts of the SMP frontage.

As the shoreline erodes towards that position, there is likely to be justification for occasional intervention to help manage the retreat. Defence measures that temporarily slow (rather than halt) erosion are likely to be acceptable, provided that these do not prevent the alongshore transport of beach sediment and do not result in the development of this area as a promontory, i.e. phases of retreat should be allowed for.



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Location reference:	***Mundesley***
Policy Unit reference:	6.08

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	No loss of property or land behind the existing defences at Mundesley. Loss of less than 5 properties along the Cliftonville frontage.	No variance	No change to landscape character of seafront.	No loss of heritage sites landward of defences.	No loss of community or recreational facilities landward of defences. Narrow beach retained.
By 2055	No further loss of property or land behind the defences.	No variance	Landscape character of seafront may change due to greater defence works.	No loss of heritage sites landward of defences.	No loss of community or recreational facilities landward of defences. Little or no beach. Lifeboat Station will remain, but possible launching issues.
By 2105	Cumulative loss of up to circa 215 houses and up to circa 35 commercial properties and associated infrastructure/ services. Loss of main road links, including section of B1159.	Some loss of cliff top grassland CWS (unless allowed to relocate inland). Improved exposure of cliffs.	Landscape character of seafront will change as . erosion takes place	Loss of some heritage sites.	Loss of some community facilities. Narrow beach present. Lifeboat Station will remain, but possible launching issues.

Location reference:	***Mundesley to Bacton Gas Terminal***
Policy Unit reference:	6.09

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

To be consistent with implementation of the long-term Plan for the whole SMP and the approach being recommended at Mundesley, the long-term Plan for this area is one of retreat. There are also very few socio-economic assets along the frontage; therefore defence would not be economically viable. A non-intervention approach will promote a naturally-functioning coastline, both providing sediment to beaches and allowing it to move freely along the coast, and fulfil nature conservation interests along this length of shoreline.

Policies to implement Plan:

From present day:	The policy option from the present day is to allow natural processes to take place, but through a policy of managed realignment to allow for defunct defences to be safely removed.. Existing timber revetment and groynes will not be maintained, although these are expected to remain for the next 5 to 15 years so will continue to have some impact upon erosion of the cliffs in the short term. There will, however, be loss of agricultural land and also loss of Mundesley holiday camp and Hillside Chalet Park.
Medium-term:	No change in policy option, from no active intervention, is proposed. This will ensure that local nature conservation interests are satisfied, although losses would continue.
Long-term:	No change in policy option, from no active intervention, is proposed.

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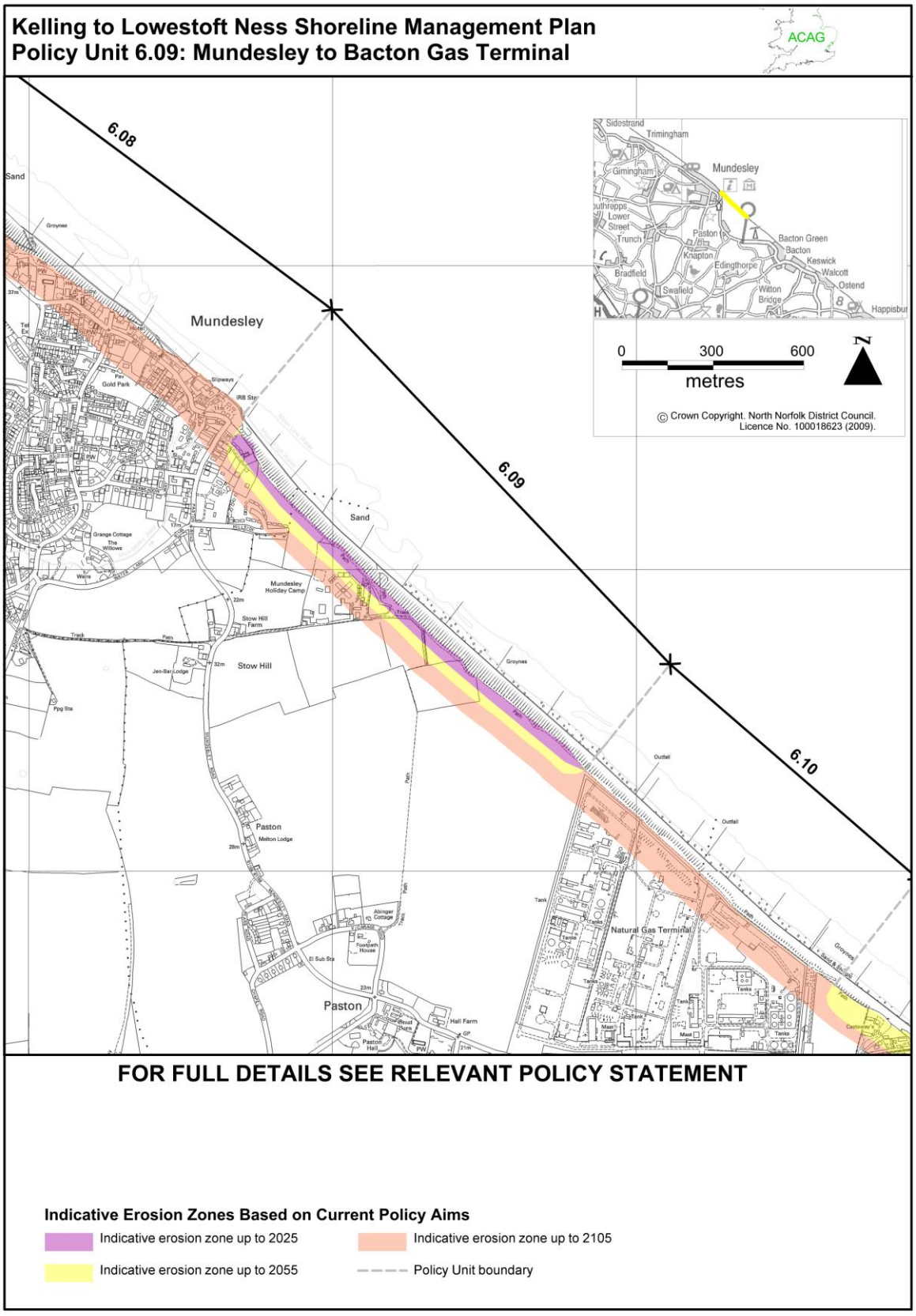

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Location reference:	***Mundesley to Bacton Gas Terminal***
Policy Unit reference:	6.09

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of some of Mundesley Holiday Camp. Loss of less than 10 seafront properties along southern end of Mundesley. Loss of Grade 1 agricultural land.	Naturally-functioning coast. Continued exposure of Mundesley cliffs SSSI.	AONB landscape quality maintained.	No loss of high importance heritage sites.	Beach present. Paston Way footpath would need to be relocated.
By 2055	Further loss of Mundesley Holiday Camp and of Hillside Chalet Park. Cumulative loss of less than 15 seafront properties along southern end of Mundesley. Further loss of Grade 1 agricultural land.	Naturally-functioning coast. Continued exposure of Mundesley cliffs SSSI.	AONB landscape quality maintained.	Loss of Saxon Cemetery.	Beach present. Paston Way footpath would need to be relocated.
By 2105	Further loss of Mundesley Holiday Camp and Hillside Chalet Park. Cumulative loss of less than 55 seafront properties at southern end of Mundesley. Total loss of up to approximately 20 hectares of Grade 1 agricultural land.	Naturally-functioning coast. Continued exposure of Mundesley cliffs SSSI.	AONB landscape quality maintained.	No further loss of high importance heritage sites.	Beach present. Paston Way footpath would need to be relocated.

Location reference:	***Bacton Gas Terminal***
Policy Unit reference:	6.10

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

Bacton gas terminal is currently a nationally-important facility and there is considerable justification for maintaining this site and subsurface pipelines. There are plans to maintain the facility into the future as part of offshore gas storage proposals. However the position of the site on the coast means that defending its present position could potentially block up to 70% of the sediment supply for the entire SMP area from reaching beaches here and downdrift if it continues to form a promontory, with much of this material potentially being lost offshore. This is a critical supply, without which erosion elsewhere may be accelerated, leading to more rapid loss of property. Due to the significance of this, the long-term Plan is to work with the owners of the facility to identify options for continuing the vital sediment movements in the medium and long term, which may include sediment bypassing.

At this point in time it is anticipated that it is still some years before this area creates this major interruption to sediment supply, therefore the immediate future defences will be maintained as long as is technically acceptable, whilst future plans and options for the site are explored.

It should be recognised that the appropriateness, timing, and viability of policy options for several other locations between Overstrand and Winterton are dependent upon a technically sustainable policy being adopted for Bacton gas terminal in the long term.

Policies to implement Plan:

From present day: The policy option is to continue to protect Bacton gas terminal site, through hold the line. This may be achieved in the immediate future through maintaining the existing timber revetment, although it is possible that new structures will be required to strengthen the defence as beach levels reduce over time and existing defences fail. However, improved defences may reduce the exposure of the cliffs, which are designated for both their geological and habitat value.

This approach may become more difficult to sustain over time and may not be environmentally sustainable in the long-term due to the potential for adverse impacts on the Winterton to Horsey Dunes SAC and Great Yarmouth North Denes SPA. It is therefore recommended that detailed studies be undertaken immediately, whilst maintaining the existing defences, to fully explore the viability and implications of the alternatives that might be considered in the future, and the mechanisms that would be required to enable and manage any change. The studies included within this work will need to consider the potential impacts on habitats and what opportunities there would be to compensate for future habitat losses. The findings of these studies would be considered within future reviews of the SMP policy options. Monitoring of sediment movements down drift will be required in relation to the Winterton to Horsey Dunes SAC and Great Yarmouth North Denes SPA.

Due to the rapid response of this shoreline to erode and resume a natural position once defences are no longer in place, this short term policy option is not considered to be detrimental to the long-term Plan.

Medium-term:	The medium-term policy option is to continue to hold the line by maintaining the defences, based upon the assumption that the terminal will still be operational for up to 50 years. The defences would probably have been strengthened to improve existing defences. This should however, be a period of relocation of any on-site assets likely to be threatened by future erosion if the site is to continue to function as at present, e.g. communication towers and gasometers, and any works necessary to avoid damage or loss of, or interference from, any subsurface assets that are to remain in place.
Long-term:	The long-term policy option is to continue to hold the line by maintaining the defences, based upon the assumption that the terminal will still be operational for up to 100 years as part of the gas storage scheme. It would probably be necessary to strengthen existing defences. However it will be necessary to avoid exacerbating problems elsewhere by allowing a supply of sand to help sustain beaches here and downdrift by beach recharge or sediment bypassing. This will deliver technical and environmental benefits.

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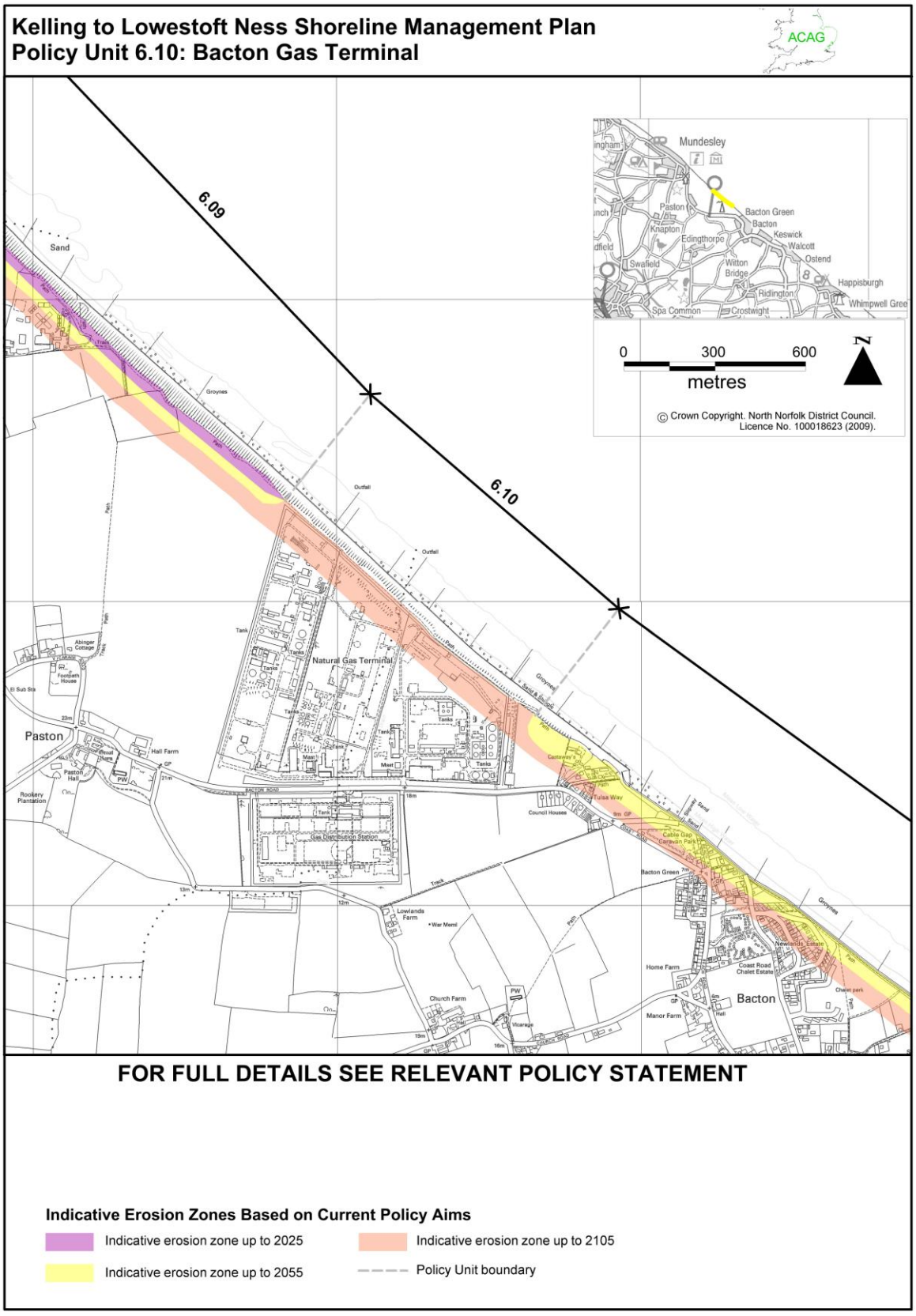

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Location reference:	***Bacton Gas Terminal***
Policy Unit reference:	6.10

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Possible slight loss of cliff-top land in front of the Gas Terminal.	Reduced exposure of SSSI designated cliffs. Defences possible detrimental to habitats.	No landscape objectives identified.	No heritage objectives identified.	No objectives identified.
By 2055	No loss of terminal, but possible issues due to drop in beach level.	Reduced exposure of SSSI designated cliffs. Defences possibly detrimental to habitats.	No landscape objectives identified.	No heritage objectives identified.	No objectives identified.
By 2105	No loss of terminal, but possible issues due to drop in beach level.	Reduced exposure of SSSI designated cliffs. Defences possibly detrimental to habitats. Mitigation required to ensure continued supply of sediment.	No landscape objectives identified.	No heritage objectives identified.	No objectives identified.

Location reference:	***Bacton, Walcott and Ostend***
Policy Unit reference:	6.11

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The long-term Plan for this area is to allow shoreline retreat once present defences reach the end of their present effective life. This is essential to ensure that problems here and elsewhere are not exacerbated by impairing the movement of beach sediment, which will occur if this shoreline continues to be held in its present position. This policy option will result in the loss of a large number of properties and associated facilities within these settlements. However, the properties and associated facilities located along this length of coast that are at risk from erosion and flooding do not generate sufficient economic benefit to justify prioritised investment in their long-term defence. This area already suffers from low beach levels and it would become increasingly difficult to sustain defences along the present line without considerable investment. For the immediate future defences are to be maintained as far as possible within existing economic justification, whilst measures are put in place to manage this risk and mitigate the displacement of people and loss of property and facilities in the medium-term.

There is already overtopping into the Upper Ant, which flows into the Broads, and any worsening of this has the potential to impact on the SPA.

Policies to implement Plan:

From present day: From the present day, the policy option is to continue to maintain existing defences, i.e. the seawall, groynes and northern end of the timber revetment at Ostend, through a hold the line policy. This will protect most of the assets behind the present defence line, although some properties will become vulnerable to erosion at the southern end of this frontage. The groynes may help to retain some beach material, but the beaches are likely to become lower and narrower than the present day. It will therefore become technically more difficult and thus considerably more expensive to protect beyond this period.

Should a more major failure of the existing defences occur, the seawall would not be rebuilt as a permanent structure. However, wherever practicable, temporary structures that assist in delaying the erosion would be used locally (e.g. placement of rock, beach recharge etc) to delay further damage whilst approaches to manage and mitigate losses are developed and supporting economic analyses undertaken

In parallel, investigations will be undertaken to identify technical options and establish an appropriate package of social mitigation measures, in preparation for the transition to the medium to long term policy option of managed realignment (see sections below). Only when such adequate mitigating social measures are identified, which minimise the impact on the lives of individuals an communities, would the change to a medium to long term policy option of managed realignment be implemented.

As the medium and long term policy is for managed realignment, ongoing monitoring of the sea wall, saline inundation and habitat monitoring will be undertaken starting in the short term, to look at the potential impacts on The Broads SAC/Broadland SPA/Ramsar. Studies to look at the future evolution of

the coast will be carried out. The results of these studies will be considered in the next review of the SMP and appropriate avoidance, mitigation and habitat compensation identified.

Due to the rapid response of this shoreline to erode and resume a natural position once defences are no longer in place, this short term policy option is not considered to be detrimental to the long-term Plan.

Medium-term:

As the long-term Plan is to allow sediment transport along this frontage, this would be a transitional period, whereby once existing defences reach the end of their life they are not replaced, as replacement is unlikely to be economically viable nor would it be technically suitable. It is presently predicted that all defences are likely to have failed by between years 20 and 40. The proposed policy option for this section of coast is therefore managed realignment. . However, this retreat will result in the loss of assets and, as such, defence measures that temporarily slow (rather than halt) erosion might be acceptable, if they can be economically justified, and provided that these do not prevent the alongshore transport of beach sediment and do not result in the development of this area as a promontory. These measures will be used for as long as possible to allow social and economic mitigation measures to be identified to minimise the impact on the lives of individuals and communities.

Long-term:

Subject to the identification of suitable social and economic mitigation measures, the long-term policy option is to allow the coastline to naturally retreat to ensure sediment supply to this, and downdrift frontages. This will deliver technical and environmental benefits, but a number of assets will be at risk. Therefore there needs to be a continuation of measures to manage losses, including erosion-slowing defences, where this can be justified. The policy is therefore one of managed realignment.

Ultimately, the shoreline will reach a position generally in line with adjacent shorelines. The increased throughput of sediment from adoption of similar policy options to the north should help beaches to build along this frontage, so that erosion, and therefore property loss, here should not continue to be accelerated over and above natural rates.

Once the shoreline reaches a more sustainable position, it may be acceptable to help retain beaches, if necessary, with structures such as short groynes, provided that these are not detrimental to continued adequate sediment throughput to areas downdrift. These should not halt erosion but would help to manage it in a sustainable manner. Therefore the policy option is managed realignment.

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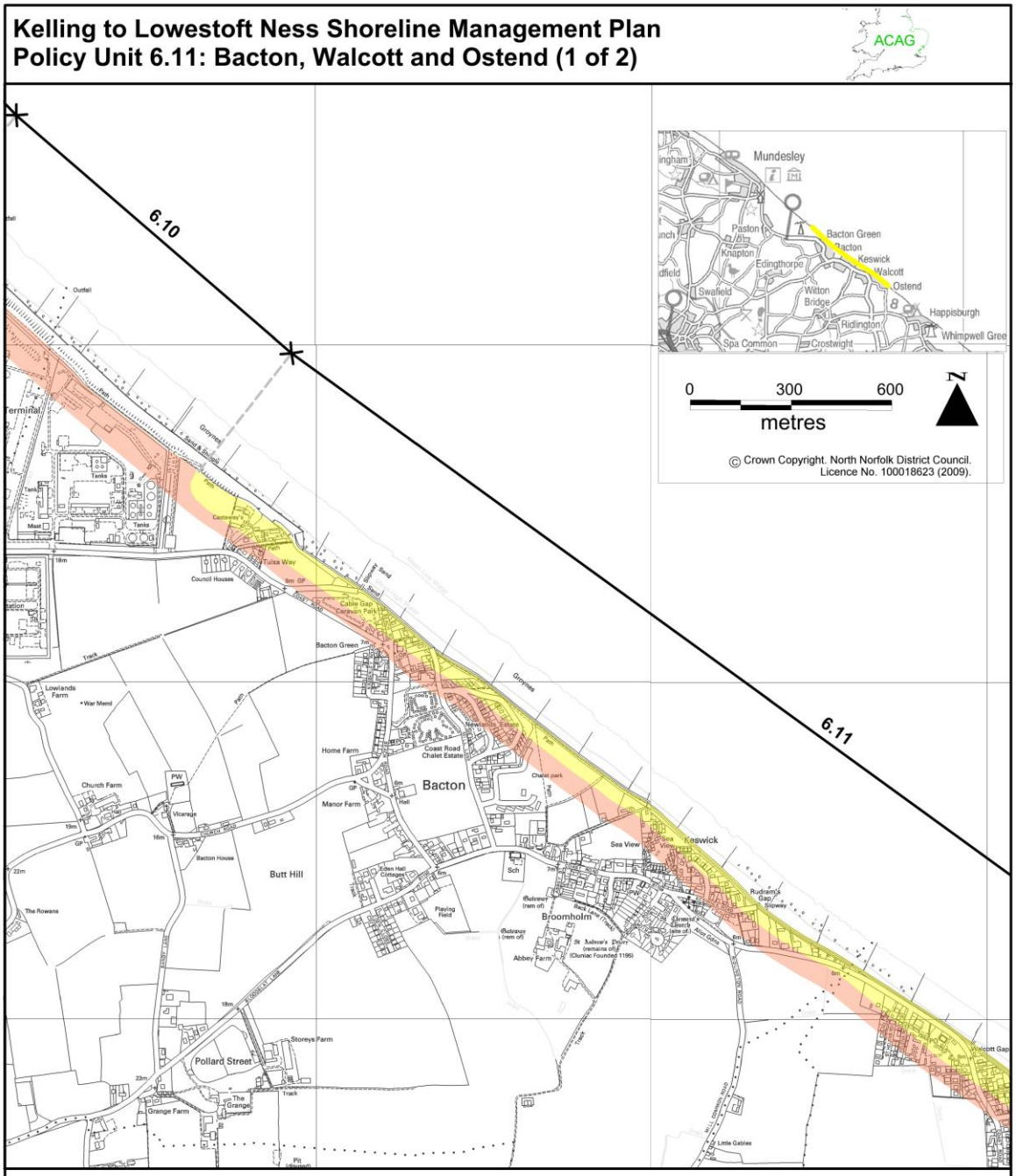
Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.11: Bacton, Walcott and Ostend (1 of 2)



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
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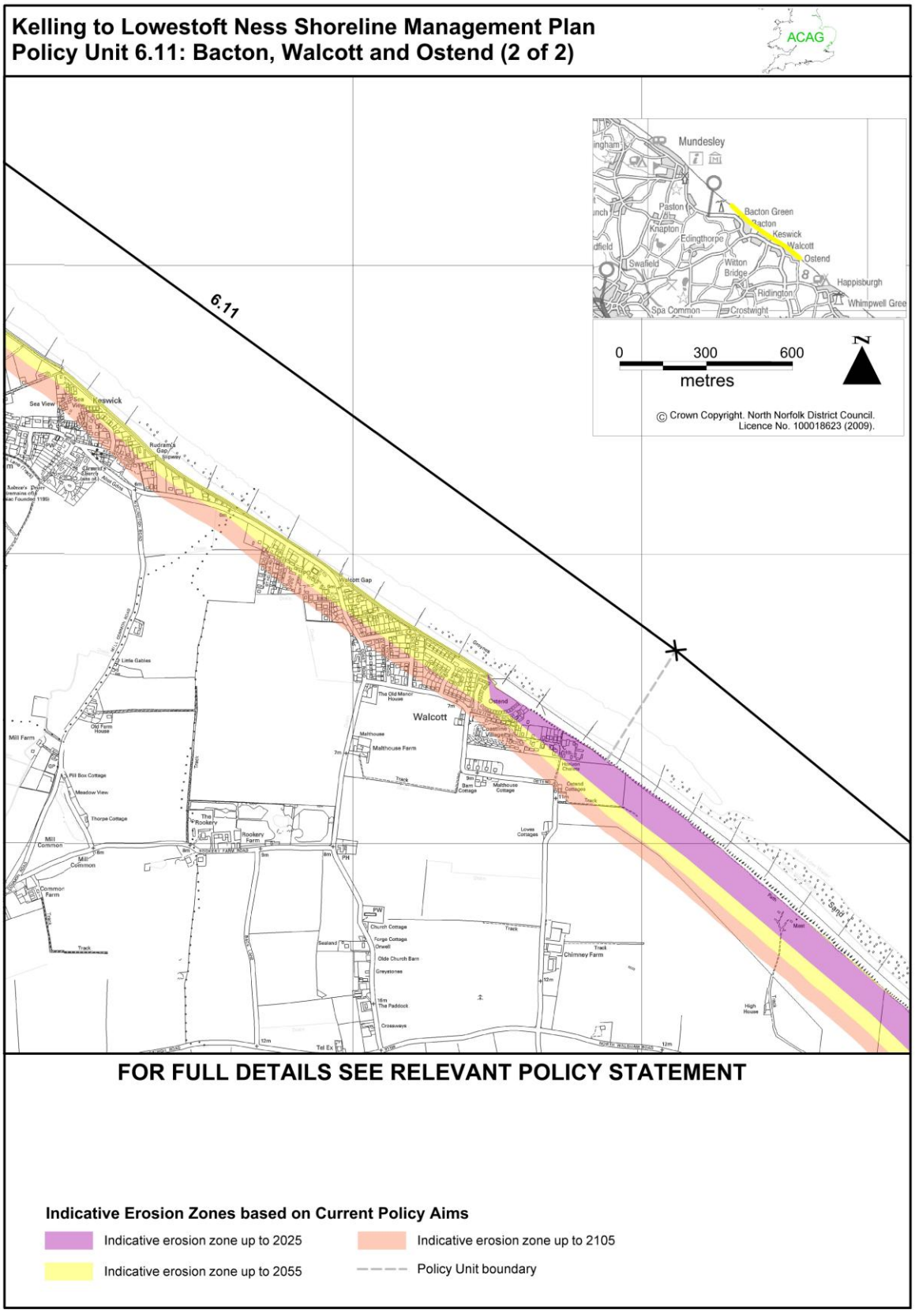

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Location reference:	***Bacton, Walcott and Ostend***
Policy Unit reference:	6.11

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	No loss of property or land behind the existing defences between Bacton and Walcott. Loss of up to circa 35 properties at Ostend.	No nature conservation objectives identified.	No landscape objectives identified.	No heritage objectives identified.	Narrow beach present.
By 2055	Cumulative loss of up to circa 195 seafront residential and 20 commercial properties. Loss of associated infrastructure. Loss of some caravan park land. Loss of main link road between Walcott and Bacton and also the emergency access route from Bacton Gas Terminal.	No nature conservation objectives identified.	No landscape objectives identified.	No heritage objectives identified.	Improved beach but access would need to be relocated,
By 2105	Cumulative loss of between circa 195 and 385 seafront residential and circa 20 to 25 commercial properties and associated infrastructure. Further loss of some caravan park land. Existing link between Walcott and Bacton and also the emergency access route from Bacton Gas Terminal lost by 2055.	Biodiversity opportunity through management of low-lying land as a saline habitat.	No landscape objectives identified.	No heritage objectives identified.	Beach present but access would need to be relocated.

Location reference:	***Ostend to Eccles***
Policy Unit reference:	6.12

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

In the long term it will not be appropriate to defend Happisburgh due to the impact this would have on the SMP shoreline as a whole, as the coastal retreat either side would result in the development of this area as a promontory making it both technically difficult to sustain and impacting significantly upon the alongshore sediment transport to downdrift areas. Although there are implications, such as loss to erosion of residential properties and amenities at Happisburgh, these are not sufficient to economically justify building new defences along this frontage. Therefore the long-term Plan is to allow natural functioning of the coast through allowing it to retreat. However, in the short term the council will make every effort to minimise the rate of coastal erosion at this location, using appropriate temporary measures, including maintenance of the existing rock bund, with a view to allowing time for measures to be introduced to allow people to adapt to the changes in the medium and long term.

Policies to implement Plan:

From present day: A no active intervention policy option at Happisburgh would result in a loss of residential properties and associated infrastructure at Happisburgh, where the policy was previously to hold the line. The existing rock bund, would continue to have a limited effect on the retreat rates in the short term (next 5 to 10 years), but will not prevent cliff erosion. This could have significant short term impacts on the community, and therefore, if it is physically possible and funding is available, the line will continue to be held at Happisburgh in the short term. However, the council will not extend or seek to substantially rebuild existing defences. As some works may be undertaken in the short term, this is a managed realignment policy.

Measures will need to be identified in the short term to help minimise the impact on the lives of individuals and communities in the medium and long term, for areas where the policy option has changed or will change from hold the line to no active intervention, in particular for the community of Happisburgh. Where it can be justified economically, minor works (for example local placement of areas of rock etc) may be undertaken at selected areas to slow the rate of cliff erosion, but not with a view to protecting the coast into the medium or long term. As and when a suitable package of social, economic and planning measures is identified, maintenance and minor repair of defences will cease, and the coastline will be allowed to continue its natural regression. Should a more major failure of the existing defences occur, they would not be rebuilt as a permanent structure. However, wherever practicable, temporary structures that assist in delaying the erosion would be used (examples – rock, beach recharge etc) to delay further damage whilst approaches to manage and mitigate losses are developed and supporting economic analyses undertaken

Medium-term:	The medium-term policy option is to continue to manage coastal retreat, so that the cliff line reaches a more sustainable position, i.e. a more natural position. There will be some loss of property and facilities during this time, therefore there needs to be continued management of this risk. However, this coastline would only be allowed to retreat once suitable social and economic mitigation measures are identified, which minimise the impact on the lives of individuals and communities. This retreat will result in the loss of assets and, as such, defence measures that temporarily slow (rather than halt) erosion might be acceptable, if they can be economically justified, and provided that these do not prevent the alongshore transport of beach sediment and do not result in the development of this area as a promontory.
Long-term:	In the long-term the policy option would be to continue to manage coastal retreat, through a policy of managed realignment. During this period it is probable that properties will continue to be threatened by erosion. However, the increased throughput of sediment from adoption of similar policy options to the north will help beaches to build along this frontage so that erosion, and therefore property loss, should not be accelerated over and above natural rates. Once the shoreline reaches a more sustainable position, it may be acceptable to help beach retention at Happisburgh, if necessary, with structures such as short groynes, provided that these are not to detrimental to continued adequate sediment throughput to areas downdrift. These should not halt erosion, but would help to manage it in a sustainable manner.

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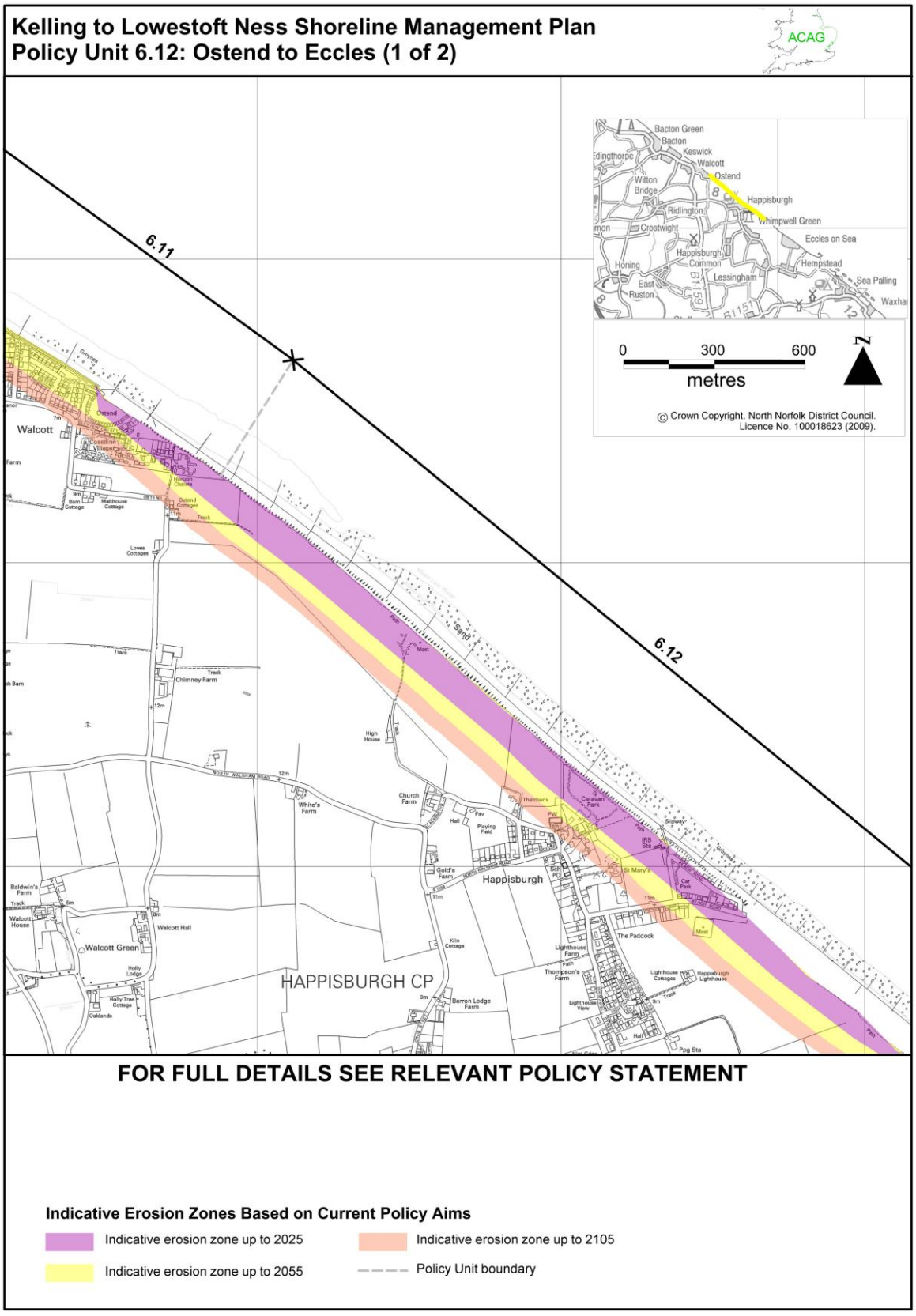

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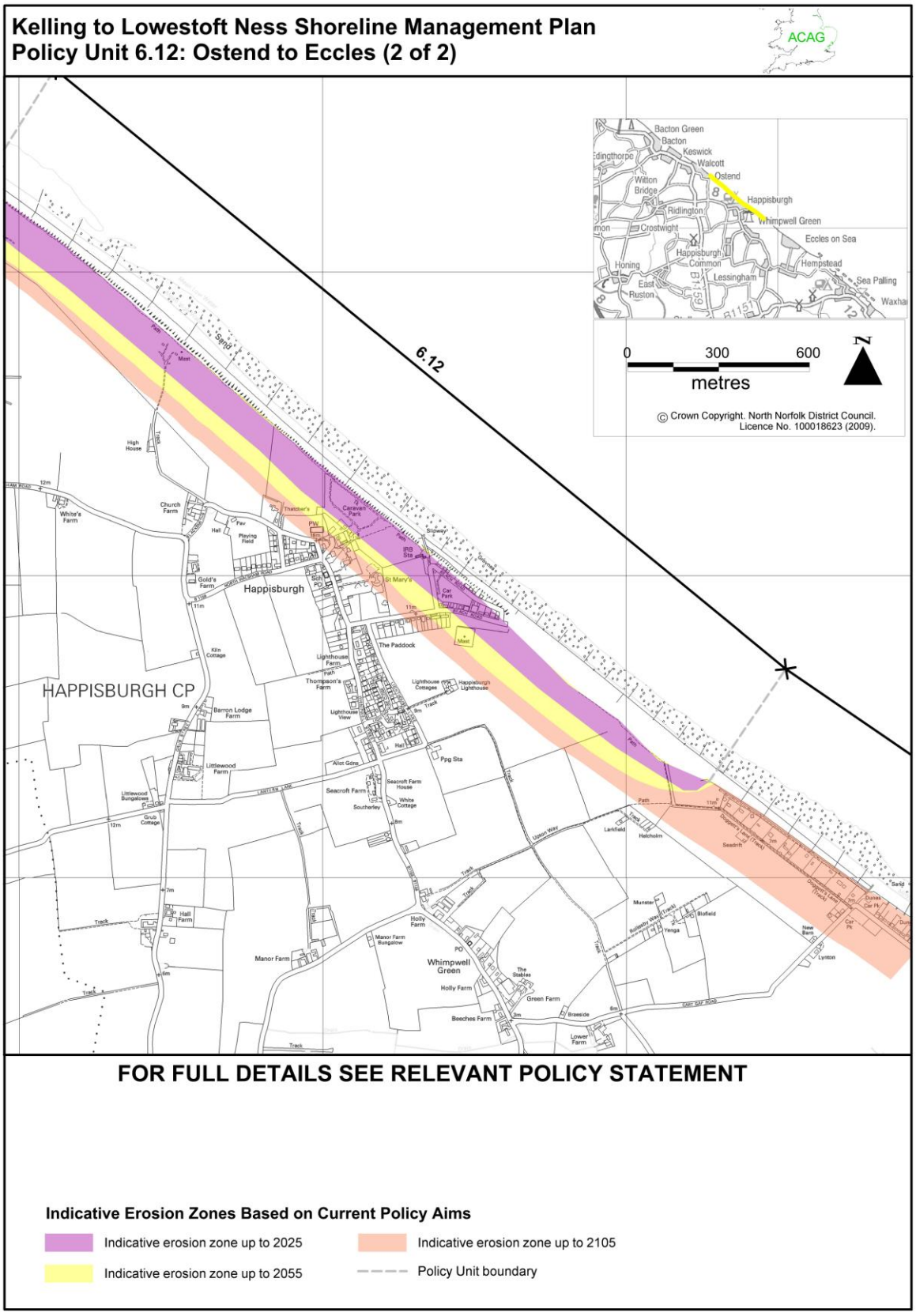

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Location reference:	***Ostend to Eccles***
Policy Unit reference:	6.12

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of less than circa 15 properties (commercial and residential), primarily along Beach Road, Happisburgh. Loss of cliff top caravan park land at Happisburgh. Loss of HM Coastguard Rescue facility. Loss of Grade 1 agricultural land.	Continued exposure of Happisburgh SSSI cliffs.	No landscape objectives identified.	No loss of cliff top heritage sites.	Little or no beach. Access may be maintained at Happisburgh.
By 2055	Cumulative loss of between circa 15 and 20 properties (commercial and residential), primarily along Beach Road, Happisburgh. Further loss of cliff top caravan park land at Happisburgh. Further loss of Grade 1 agricultural land.	Continued exposure of Happisburgh SSSI cliffs.	No landscape objectives identified.	Grade 1 St Mary's church and Grade II Manor House at risk of erosion.	Beach present, but probable loss of existing access at Happisburgh.
By 2105	Cumulative loss of between circa 20 and 35 properties. Loss of cliff top caravan park land at Happisburgh. Total loss of up to approximately 45 ha of Grade 1 agricultural land.	Continued exposure of Happisburgh SSSI cliffs.	No landscape objectives identified.	Probable loss of Grade 1 St Mary's church and Grade II Manor House.	Beach present, but probable loss of existing access at Happisburgh.

Location reference:	***Eccles to Winterton Beach Road***
Policy Unit reference:	6.13

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

This unit differs from the majority of other units within the SMP, as there is a risk of coastal flooding, as well as coastal erosion. The beach along this section is backed by a dune system, narrow in places, for much of its length and the land behind is low lying for many miles. A significant proportion of the dune system is in turn protected by a concrete sea wall and apron and other existing defences include groynes and offshore breakwaters. The coastline is very exposed and this could mean that technically and economically it may become increasingly difficult to hold the present shoreline position in the longer term. Eventually (possibly beyond the timescale of this SMP), beaches may become impossible to retain in their current position, even with continual re-nourishment, as sea-level rise and coastal squeeze results in higher exposure of the shoreline defences. If the shoreline to the north continues to erode, the Eccles to Winterton stretch this will also become more prominent and will increasingly reduce any sediment, resulting from natural coastal erosion to the north, reaching areas to the south. If the shoreline is held beyond a certain time it is possible that it may never recover to reform as a natural system to feed these areas. This could accelerate erosion and compromise both defences and natural habitats to the south.

A more sustainable defended position may therefore be a retreated formal defence line, which may allow a natural beach to form along the seaward edge of this area and sediment movement to take place, feeding dunes and beaches along both this frontage and to the south. This would result in the large scale loss of homes, businesses, infrastructure and farmland in and close to the floodplain, as well as a dramatic change in shoreline and hinterland characteristics. The consequences of this would be wide ranging, including impacts on communities, tourism, habitats, landscape etc

There may be potential for nature conservation and biodiversity opportunities to result from this, however there would be losses of currently designated coastal sites and potential impacts on other sites and habitats further inland, within The Broads SAC and Broadland SPA/Ramsar sites.

Such dramatic changes obviously require more detailed investigation and in the short and medium-term the present defences are to be maintained whilst the retired line option is fully investigated, in terms of its social, economic and environmental consequences. This will be done through a number of studies, which will need to determine the viability, approach, timing, consequences, and any measures that would need to be put in place to manage risk. Such studies should primarily confirm the viability of a managed realignment policy option and, if this is confirmed, then it should also generate recommendations regarding mitigation for the displacement of people and the loss of property, businesses, infrastructure and other assets. Further studies and monitoring to assess the potential for habitat loss, compensation and natural change will also be essential, in line with the Habitat Regulations Assessment process.

Policies to implement Plan:

From present day: Due to the considerable assets at risk and the uncertainty of how the coastline could evolve, the policy option from the present day is to continue to hold the line of the existing defence. This policy option is likely to involve maintenance of existing seawalls and reef structures, replacing groynes as necessary and continuing to re-nourish beaches with dredged sand. This policy option will provide an appropriate standard of protection to all assets behind the present defence line, and, with the recharge, a beach will be maintained as well as a supply of sediment to downdrift areas.

However, this approach may become more difficult to sustain over time and may not be economically, technically or environmentally sustainable in the long-term (see below). It is therefore recommended that detailed studies be undertaken immediately, whilst maintaining the existing defences, to fully explore the viability and implications of the alternatives that might be considered in the future, and the mechanisms that would be required to enable and manage any change. The studies included within this work would consider the potential impacts on habitats within the broads and dunes, what habitat would result naturally from any long term managed realignment and what opportunities there would be to compensate for future habitat losses. The findings of these studies would be considered within future reviews of the SMP policy options.

Monitoring of sediment movements down drift will also be required in relation to the Winterton to Horsey Dunes SAC and Great Yarmouth North Denes SPA.

This approach is not considered detrimental to the long-term Plan for the SMP as it includes continued provision of new sediment into the beach system and does not exacerbate problems elsewhere in the short term.

Medium-term: No change in policy option from hold the line, but recommendation for continued studies to assess sustainability of this policy option and to investigate possible managed realignment options for the long-term. Where habitat creation is required to offset potential losses in the long term, it may be necessary to start implementing this in the medium term.

Long-term: In the long-term the Plan for this area may be to adopt a retired line of defence further inland; however this would only be pursued once it was confirmed, with a high degree of certainty, that holding the present line is becoming technically, economically and environmentally unsustainable This would therefore be a conditional hold the line policy. Until this condition is met the present line of defence will continue to be held by undertaking routine and reactive maintenance. Precisely when continuing to defend along the present line will be shown to be unsustainable is difficult to predict, and may indeed be beyond the 100 year period considered in this plan. The long term sustainability of the hold the line policy option will depend upon a number of factors such as:

(i) The point at which is becomes too expensive to continue to defend the present line, rather than a retired line; although this analysis of costs and

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benefits should be based on a wide ranging economic assessment to include homes, businesses, tourism, agriculture, infrastructure etc.

(ii) Any proven impact that holding the line has upon shorelines to the north and south and the technical capability to mitigate this through measures elsewhere,

(iii) The ability of the held shoreline to recover and reform as a natural beach, as if it is left too late it may never recover,

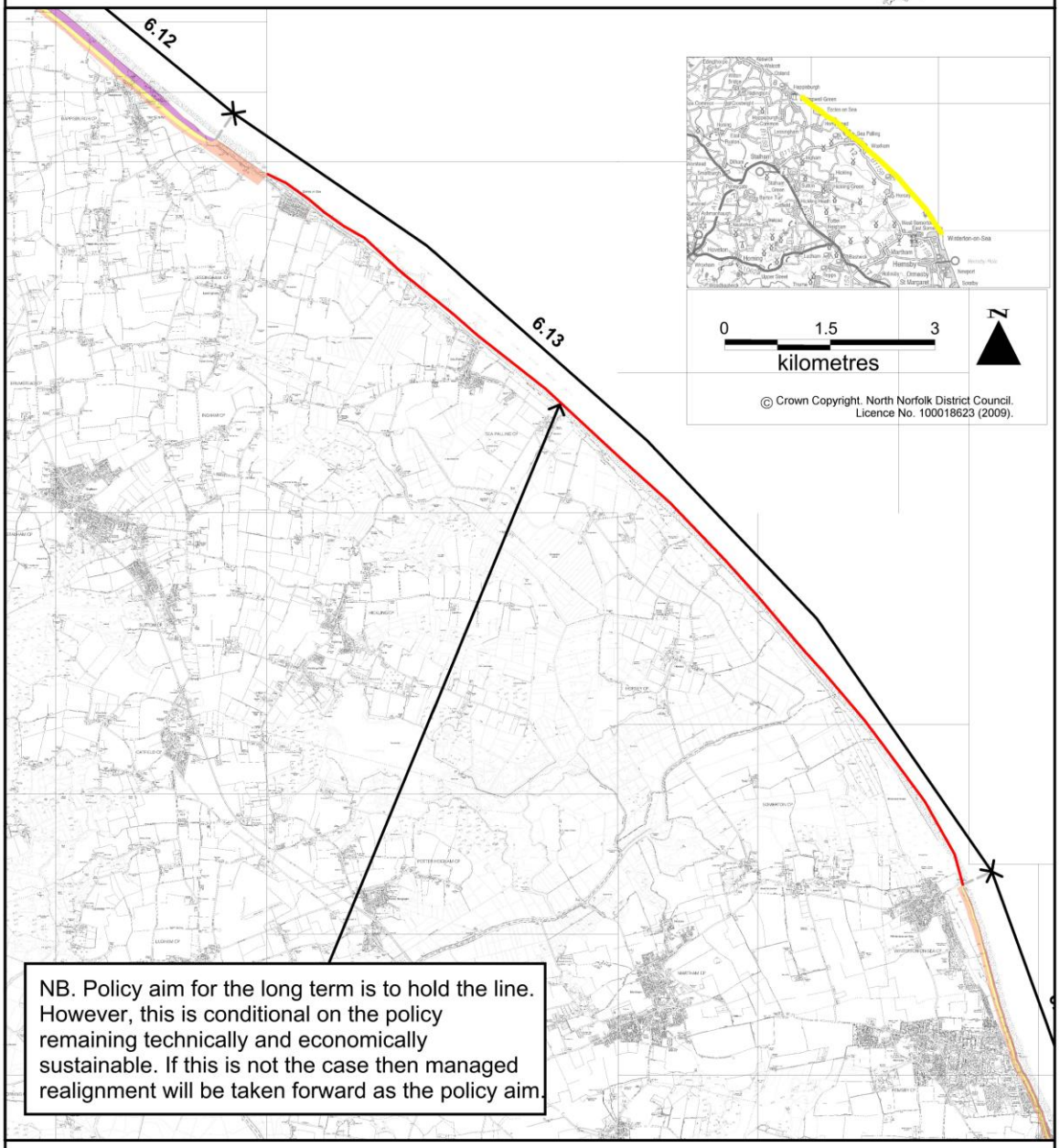
(iv) Improved understanding of the evolution of natural habitats and thus environmental costs and benefits, as well as the potential for habitat compensation to be provided, and

(v) The ability to put in place acceptable measures to mitigate impacts on individuals and communities that are likely to result from managed realignment.

All of these factors should be the subject of prior investigation and no final decision should be taken before completion of these detailed studies. Only when all of these factors can be satisfied will a changes of policy option to managed realignment be proposed, and this may be beyond the 100 year period covered by this plan.

Current understanding of the consequences of major inundation of the Broads area is not sufficient to identify potential options with any certainty. This would require a significant amount of further study to be undertaken. The analysis of the future sustainability of holding the line within this unit will therefore need to include a thorough assessment of the potential alternatives available for managed realignment in this area, most likely in the form of a future coastal strategy study. Of particular importance will be the further studies to investigate both the positive and negative effects on the The Broads SAC and Broadland SPA/Ramsar sites. Any long term move to a policy of managed realignment must be based on a thorough analysis (following monitoring and modelling) of the consequences for habitats and species of European importance. This is a condition that must be met in order for there to be any change in coastal policy.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.13: Eccles to Winterton Beach Road



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Location reference:	***Eccles to Winterton Beach Road***
Policy Unit reference:	6.13

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	***Property & Land Use***	***Nature Conservation***	***Landscape***	***Historic Environment***	***Amenity & Recreational Use***
By 2025	No loss of property or land behind the existing defences.	No loss of dunes behind seawall and beach maintained through recharge.	No change from present.	No loss of sites behind the existing defences.	Beach present (with recharge) Car parking facilities maintained. Sea Palling IRB station maintained. No change to facilities behind existing defences.
By 2055	No loss of property or land behind the existing defences.	No loss of dunes behind seawall and beach maintained through recharge.	No change from present.	No loss of sites behind the existing defences.	Beach present (with recharge) Car parking facilities maintained. Sea Palling IRB station maintained. No change to facilities behind existing defences.
By 2105[1] Whilst holding the line.	No loss of property or land behind the existing defences.	No loss of dunes behind seawall and beach maintained through recharge (although increased rates and frequency of recharge likely).	No change from present.	No loss of sites behind the existing defences.	Beach present (with recharge), but may become more difficult to maintain. Car parking facilities maintained. Sea Palling IRB station maintained. No change to facilities behind existing defences.
By 2105[2] When moving to managed	Loss of large numbers of properties and up large areas of agricultural land.	Naturally-functioning system with possible large biodiversity gain but wider impact on Broadland habitats.	Significant impact on existing landscape of the broads, but with a possible enhancement of landscape quality in the long	Loss of/ damage to heritage sites, including Waxham Barn, windmills and Grade II and II* properties.	Change in beach location/ characteristics. Car parking facilities lost.

realignment	Associated infrastructure lost	Net loss in frontal dune volume.	term.		Sea Palling IRB station lost. Loss of facilities. Major loss of tourism draw of Norfolk Broads

1 – Existing defences maintained up to 2105.

2 – Retired line of defence implemented by 2105.

Location reference:	***Winterton-on-Sea (South of Beach Road) to Scratby***
Policy Unit reference:	6.14

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

This area is of international significance for its dune habitats, which require a sediment supply to fronting beaches and fore dune-beach interactions to be able to function. The long-term policy options for the shoreline frontages to the north will enable this requirement to be met, but this will need to be complimented by not constructing defences along this frontage, which would be detrimental to both habitats and natural defence provided by the beach-dune system. The long-term Plan is therefore to allow a naturally–functioning coast to develop through allowing the beach and backshore to evolve with minimal intervention. There is, however, some uncertainty on the long-term evolution of the coast due to the unpredictable nature of the nesses, therefore there may need to be some soft management of the retreat in response to natural changes, for example improved dune access management to limit damage resulting from human activities. The village of Winterton is not expected to be at risk as a consequence of this Plan, although seafront amenities and properties in Newport and Scratby would become vulnerable.

Policies to implement Plan:

From present day:

Not intervening at all could lead to a loss of residential properties at Scratby, where the policy was previously to hold the line. Therefore if it is physically possible, and funding is available, the line will continue to be held at Scratby in the short term to allow for social mitigation measures to be implemented. There will also be some localised dune management measures put in place as the dunes provide a natural defence, albeit subject to occasional breaching. The overall policy will therefore be managed realignment.

Measures will need to be identified and implemented to help minimise the impact of this policy option on the lives of individuals and communities from the short term through to the long term. If holding the line at Scratby is not physically or financially viable then minor works (for example local placement of areas of rock, beach replenishment etc) may be undertaken here and at other selected areas, to slow the rate of coastal erosion, but not with a view to protecting the coast into the medium or long term. As and when a suitable package of social, economic and planning measures is identified, maintenance and minor repair of defences will cease, and the coastline will be allowed to continue its natural regression.

Nature conservation requirements would be fulfilled by this policy option.

Medium-term: No change from the above policy option of managed realignment, but only to allow minimal intervention, and the removal of defence ruins. This may result in loss of seafront assets in Newport and Scratby.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Long-term:	No change from the above policy option of managed realignment, but only to allow minimal intervention. Beaches and dunes are likely to move landward, which may result in loss of seafront assets in Newport and Scratby. However, it might be expected that these features would be sustained as a result of adopting the long-term policy options for frontages further north within the SMP shoreline.

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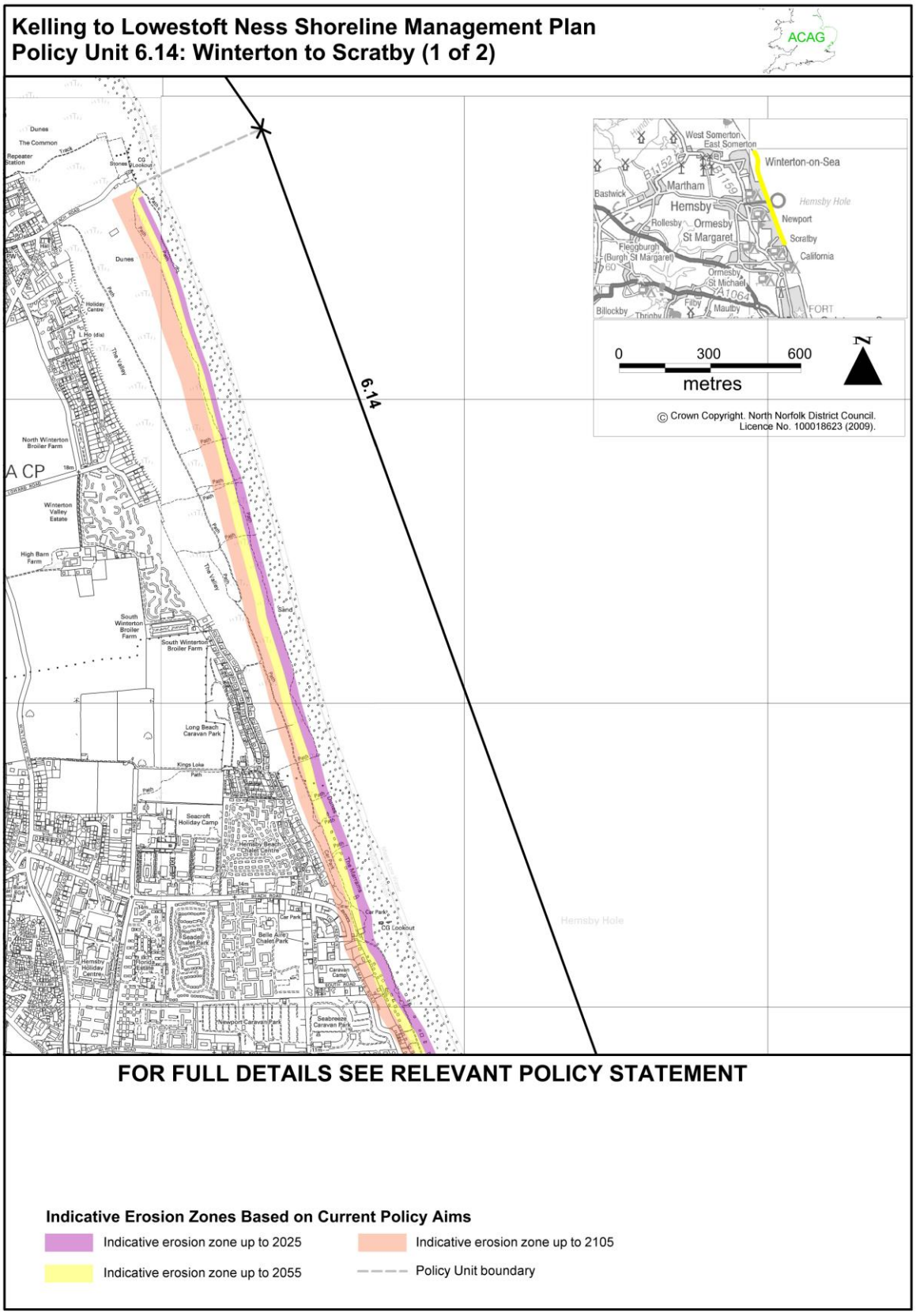

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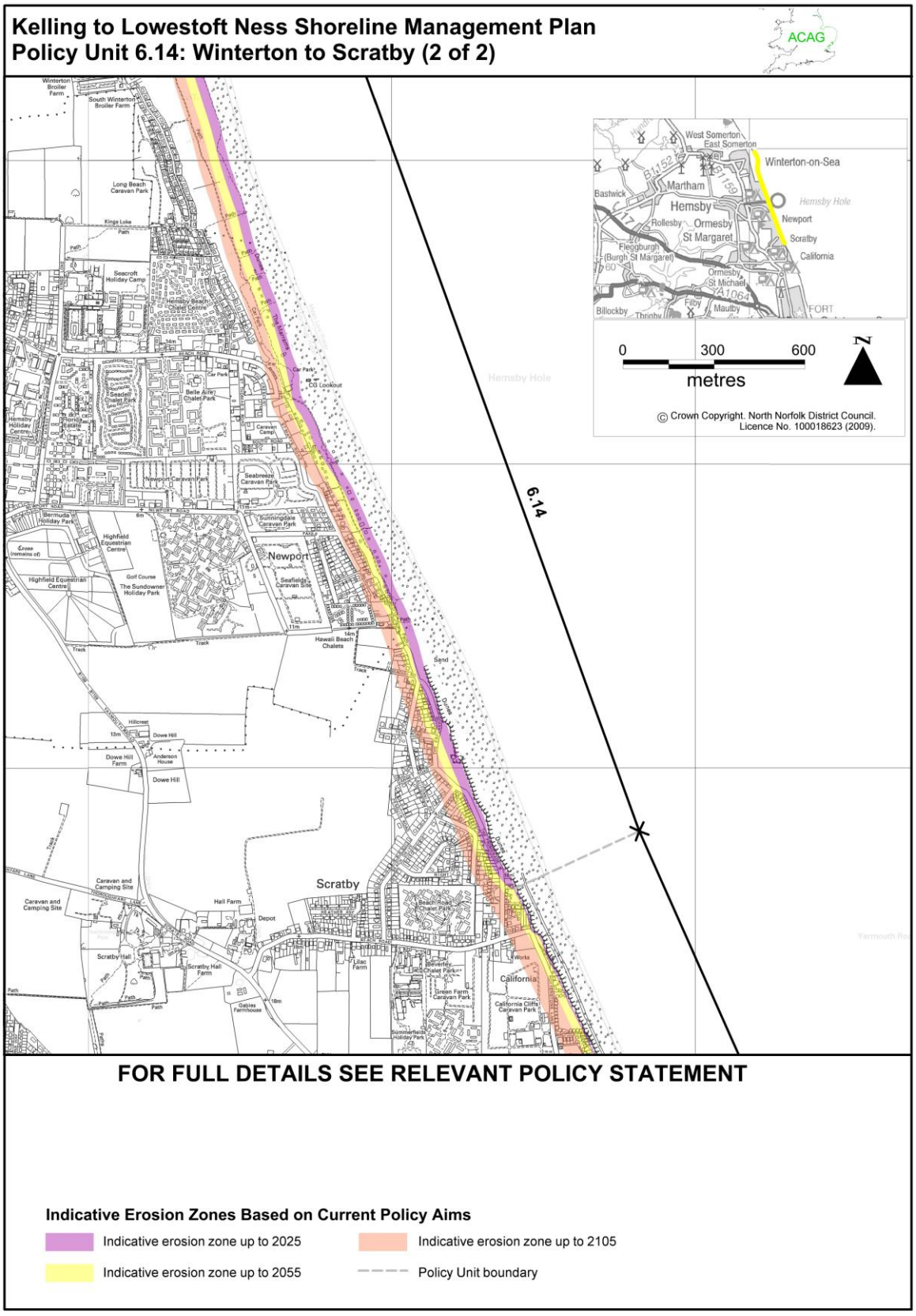

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Location reference:	***Winterton-on-Sea (South of Beach Road) to Scratby***
Policy Unit reference:	6.14

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of up to less than 5 seafront properties and associated infrastructure.	Erosion and possible loss of Hemsby Marrams, but management proposed. Naturally-functioning coast promoted.	No landscape objectives identified.	No heritage objectives identified.	Beach present and access routes possible. Low risk of loss of tourist facilities.
By 2055	Cumulative loss of up to circa 55 seafront properties in Newport and Scratby also loss of holiday developments and associated infrastructure. Loss of link roads.	Erosion and possible loss of Hemsby Marrams, but management proposed. Naturally-functioning coast promoted.	No landscape objectives identified.	No heritage objectives identified.	Beach present and access routes possible. Loss of tourist and local facilities along seafront.
By 2105	Cumulative loss of between circa 55 and 150 seafront properties in Newport and Scratby also loss of holiday developments and associated infrastructure. Loss of link roads.	Erosion and possible loss of Hemsby Marrams, but management proposed. Naturally-functioning coast promoted.	No landscape objectives identified.	No heritage objectives identified.	Beach present and access routes possible. Loss of tourist and local facilities along seafront.

Location reference:	***California to Caister-on-Sea***
Policy Unit reference:	*6.15*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The shoreline here, together with that to the south, currently forms a small promontory, which is likely to become much more pronounced as sea levels rise and the adjacent shorelines to the north retreat. This could eventually have detrimental impacts on downdrift areas, due to interruption to alongshore transport of sediments and increasing losses to offshore, diminishing natural defence and natural habitats elsewhere. In the long-term this frontage would also become technically more difficult, and thus more expensive, to maintain. The long-term Plan is therefore to allow retreat of the coastline, to improve sediment feed to downdrift areas. However, failure to maintain this position in the short term would lead to a set back in the shoreline and could create problems at Caister, where there are considerable properties at risk, as well as at California. Therefore, in the short term existing defences will be maintained to continue to provide protection to this frontage. This will allow measures to be put in place to manage risk and mitigate the displacement of people, and the loss of property and assets.

Policies to implement Plan:

From present day:

To continue to protect assets, the policy option is to continue to hold the line through routine and reactive maintenance of existing defences, i.e. the rock bund, rock groynes and concrete wall, until failure. The lifetime of these structures is predicted to extend beyond this period; therefore existing assets will continue to be protected, although some erosion may occur directly behind the rock bund at California. This will involve maintenance costs, but it is not proposed that defences be replaced once they reach the end of their life.

In parallel, investigations will be undertaken to identify technical options and establish an appropriate package of social mitigation measures, in preparation for the transition to the medium and long term policy option of managed realignment (see sections below). Only when such adequate mitigating social measures are identified to limit the impact on the lives of individuals and the community, would the change to a managed realignment policy option be implemented.

Monitoring of sediment movements down drift will be required in relation to the Great Yarmouth North Denes SPA.

This policy option will not be detrimental to the long-term Plan due to the rapid shoreline response along this coastline once defences are no longer in place.

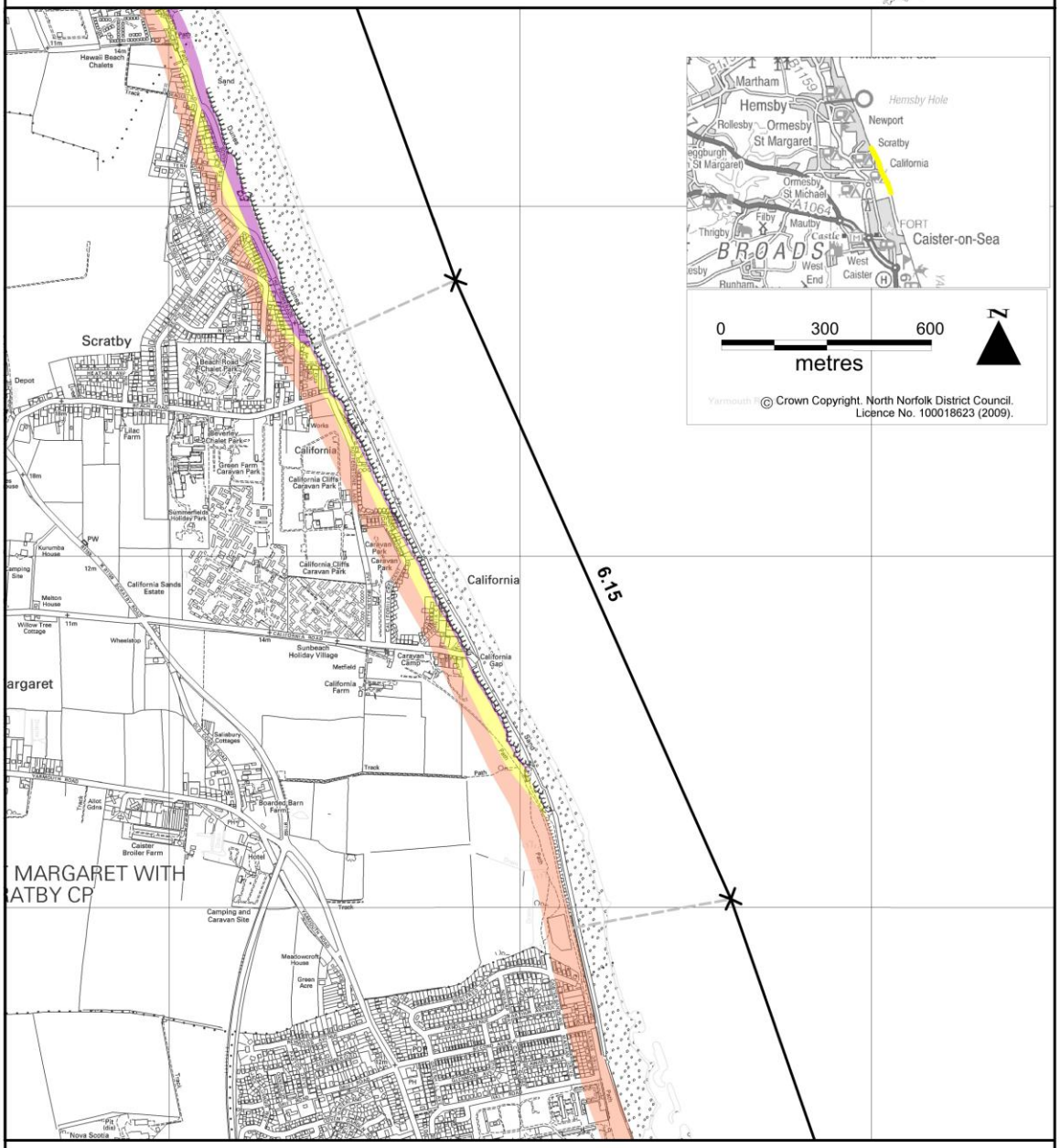
Medium-term:

The long-term aim is to allow a naturally-functioning coast; therefore in the medium-term the policy option is to no longer maintain the existing defences. The cost of maintaining defences is likely to increase over time, due to the increasing exposure, and their effectiveness will reduce over time. Once the defences fail, the cost of constructing new ones is unlikely to be economically viable and technically unsuitable in their current position. However, these defences are likely to still have an impact for most of this period, allowing measures to be put into place to manage the future risk. Retreat of the coast is expected to result in loss of cliff-top assets at California. Therefore the policy

	option is to maintain existing defences until they fail, and then allow retreat through managed realignment. The move to managed realignment will only be undertaken once suitable mitigation measures, developed in the short term, are identified to limit the impact on the lives of individuals and the community, the coast should be allowed to retreat. In the interim, temporary measures to slow erosion may be applied.
Long-term:	The long-term policy option is to allow shoreline retreat through managed realignment. The existing defences may still have a residual effect and reduce erosion rates along this frontage. However, should these structures be found to be impeding the movement of adequate sediment volumes along the shoreline, then consideration might be given to their removal. This retreat will result in loss of cliff-top assets; therefore measures, identified in the short to medium term, need to be in place to deal with risk management and mitigation.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.15: California to Caister-on-Sea



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***California to Caister-on-Sea***
Policy Unit reference:	*6.15*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of less than 5 seafront properties. Low risk of damage to link road between Scratby and California.	Minimal loss of Caister Point CWS.	No landscape objectives identified.	No heritage objectives identified.	Beach present. Tourist facilities unlikely o be affected.
By 2055	Cumulative loss of up to circa 70 seafront properties, including holiday accommodation and associated infrastructure. Loss of section of link road between Scratby and California.	Some loss of Caister Point CWS, but naturally-functioning coast promoted.	No landscape objectives identified.	No heritage objectives identified.	Beach present and access possible. Some loss of seafront tourist facilities.
By 2105	Cumulative loss of between circa 70 and 130 seafront properties, including holiday accommodation and associated infrastructure. Loss of link road between Scratby and California.	Some further loss of Caister Point CWS, but naturally-functioning coast promoted.	No landscape objectives identified.	No heritage objectives identified.	Beach present and access possible. Further loss of seafront tourist facilities.

Location reference:	***Caister-on-Sea***
Policy Unit reference:	*6.16*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The shoreline here, together with that to the north, currently forms a small promontory, which is likely to become much more significant as sea levels rise and the adjacent shorelines to the north retreat. This could eventually have detrimental impacts for much of Caister and on downdrift areas, due to interruption to alongshore sediment transport and increasing losses to offshore, diminishing natural defence and natural habitats here and elsewhere. In the long-term this frontage would become technically more difficult, and thus expensive, to maintain. The long-term Plan for the frontage would therefore be to enable the beach and backshore to evolve more naturally by improving the alignment between California and Caister Ness, and allowing the shoreline position to retreat back to a more natural position. This would, however, result in loss of some seafront assets; therefore in the short and medium-term the Plan is to maintain the existing defences whilst measures are developed and put in place to manage any risk and mitigate the displacement of people, and the loss of property and assets.

Policies to implement Plan:

From present day:

The policy option for the present day is to continue to hold the line through maintaining and if necessary renewing the existing defences; comprising seawalls, rock reefs and groynes. This will protect property and associated assets behind the defences.

In parallel, investigations will be undertaken to identify technical options and establish an appropriate package of social mitigation measures, in preparation for the transition to the long term policy option of managed realignment. 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 option be implemented.

Monitoring of sediment movements down drift will be required in relation to the Great Yarmouth North Denes SPA.

This policy option will not be detrimental to the long-term Plan due to the rapid nature of shoreline response along this coastline once defences are no longer in place.

Medium-term:

The medium-term policy option is to continue to maintain existing defences to protect the seafront assets, through a policy of hold the line. During this period, however, the area will increasingly become a promontory, beaches are expected to begin to narrow, potentially reducing this as a recreational facility over time and interrupting sediment feed onto areas further south. The cost of maintaining defences is also likely to increase *inter alia* as a result of increasing exposure due to sea level rise; therefore as the defences reach the end of their effective life they should not be replaced with similar structures.

During this period, the social mitigation measures identified in the short term period of the plan will need to be put in place to determine how to manage the

future retreat and any relocation of people, property and facilities.

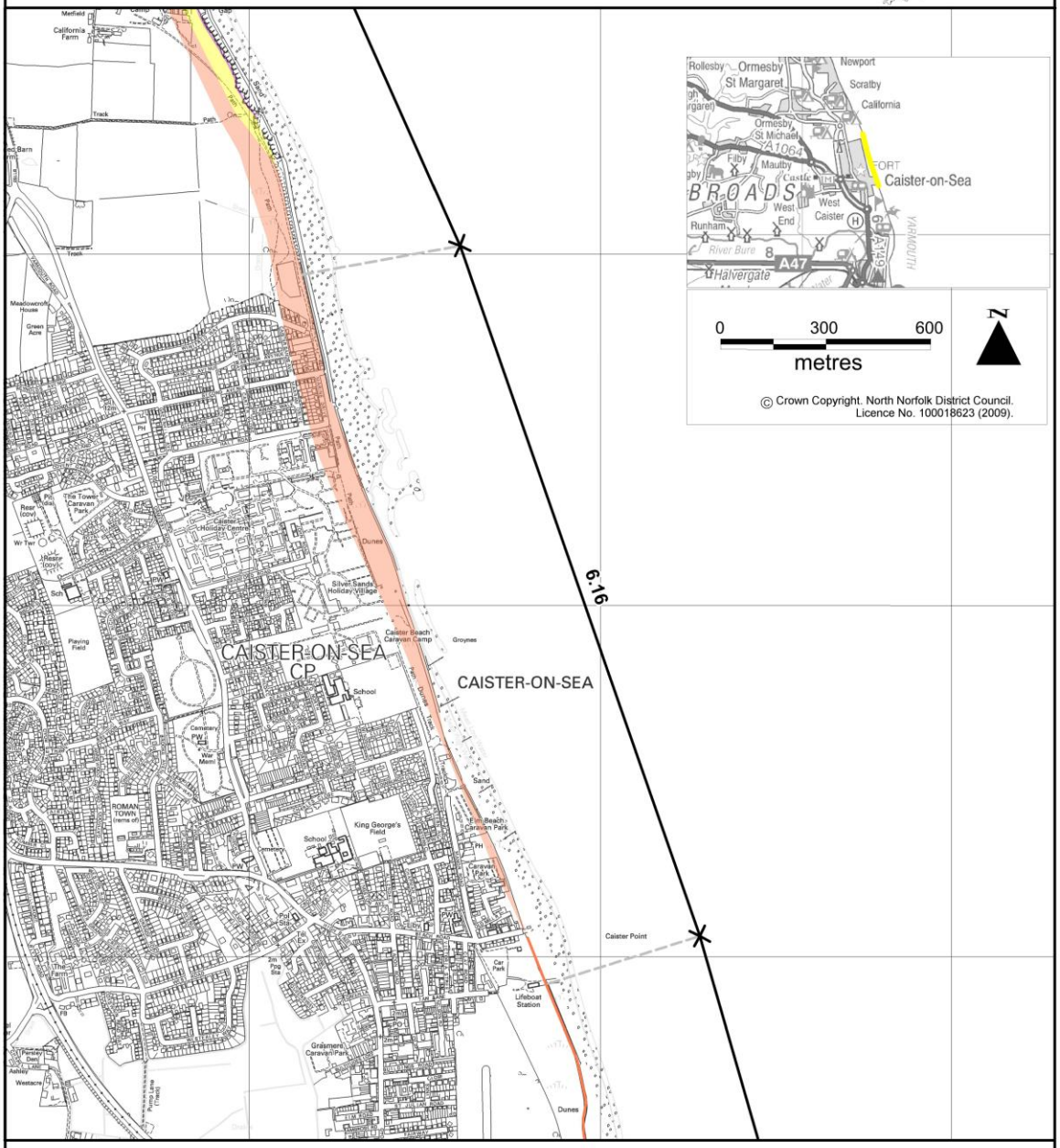
Long-term:

The long-term policy option is to allow shoreline retreat, thus allowing sediment throughput to downdrift areas, and not committing to escalating defence costs. By this stage the coast will stand several tens of metres seaward of the adjacent shoreline to the north and the cost of maintaining defences will be high. The rock reefs will probably remain and add to stability to the beach system and slowing retreat, although their effectiveness is likely to be reduced.

To achieve the Plan the shoreline needs to reach a point more in keeping with the natural position had it not been defended. At this point beaches should be healthier as a result of this realignment and with increased sediment feed as a consequence of adoption of the policy options to the north, and it is expected that erosion rates will again slow. As a result future management of this shoreline could be more easily achieved, through measures such as groynes, if required, without being detrimental to other parts of the SMP frontage. Therefore the policy option is to allow retreat through managed realignment.

This retreat will result in the loss of some seafront properties, primarily at the northern end of Caister, as the shoreline re-orientates. The extent of losses, if any, at the southern end is uncertain and dependent upon future evolution of Caister Ness, which is has not been predicted at the present time. As a loss of property has been identified, it is important that the measures identified in the in the short term period of the plan, and put into action in the medium-term continue to be in implemented in the long term to limit the impact on the lives of individuals and the community.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.16: Caister-on-Sea



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Caister-on-Sea***
Policy Unit reference:	*6.16*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	No loss of property or land behind the existing defences.	No variance	No landscape objectives identified.	No key sites at risk.	Beach present and access maintained. No loss of community or recreational facilities landward of defences.
By 2055	No loss of property or land behind the existing defences.	No variance	No landscape objectives identified.	No key sites at risk.	Beach present and access maintained. No loss of community or recreational facilities landward of defences.
By 2105	Loss of up to circa 50 properties (commercial and residential) and associated infrastructure/ services. Loss of seafront holiday centres and caravan parks.	No variance	No landscape objectives identified.	No key sites at risk.	Narrow beach present but access may need to be relocated. Loss of some seafront community facilities. Narrow beach present.

Location reference:	***Great Yarmouth***
Policy Unit reference:	*6.17*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

Great Yarmouth is a major area of industry and commerce and has also recently seen the construction of the Great Yarmouth Outer Harbour. Despite feed of sand from the north, the beach is not expected to improve significantly compared to its present condition, becoming lower and narrower in places as sea levels rise, although in the long-term it will benefit from increased sediment supply as a result of the policy options to the north. Therefore the long-term Plan is to continue to protect assets within the town from both erosion and from flooding.

Policies to implement Plan:

From present day:

The present-day policy option for this area is to continue to hold the line and protect all built assets within the town. Achievement of this requires no intervention along much of this frontage due to the wide beach, although some defence works may be required at the southern end to maintain existing seawalls and groynes and the port entrance. This policy option will protect the maximum number of assets and satisfy nature conservation requirements at North Denes as the area in front of the seawall is expected to remain fairly stable during this period.

Monitoring of sediment movements down drift will be required in relation to the Great Yarmouth North Denes SPA. It will be necessary to undertake further studies into the potential consequences of holding the line and accretion levels for the medium to long term, the results of which will be considered in the next review of the SMP, which will be subject to the full HRA process (including the identification of mitigation/compensation as necessary or appropriate)

This approach is consistent with the long-term Plan for this section of shoreline.

Medium-term:

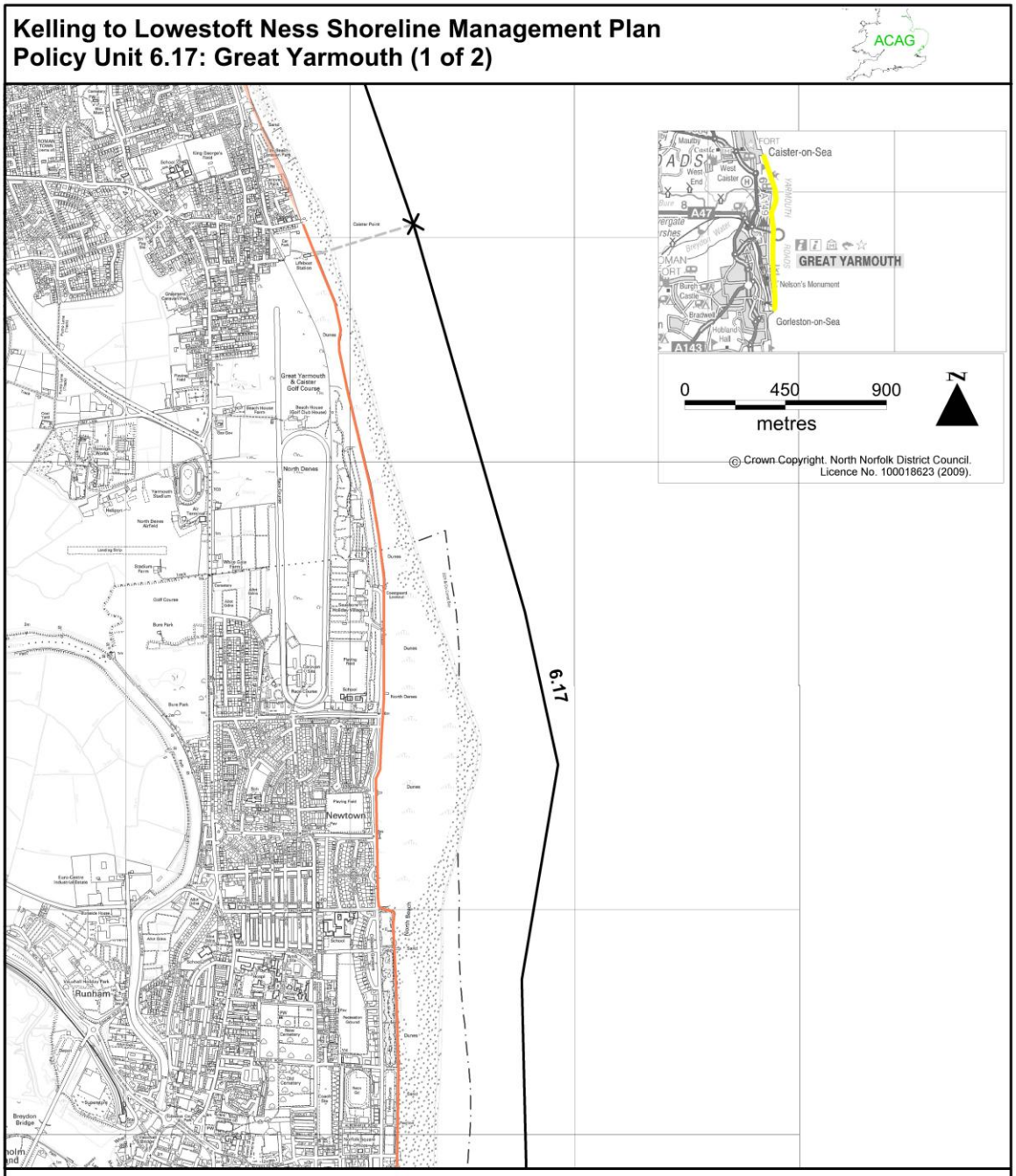
The medium-term policy option is to continue defending the frontage beyond the short term, through a policy of hold the line. This would most likely be provided through maintaining, replacing and upgrading existing structures where necessary, with the beach continuing to provide the primary defence to much of the area.

This will continue to protect all built assets, but the beach is likely to begin to narrow and steepen due to sea level rise and limited sediment feed as a result of policy options further north. This may result in additional work being required to improve some parts of the seawall to maintain its integrity as a defence, particularly towards the northern and southern extremities. Any steepening of the foreshore could also have implications for the area suitable for tern colony nesting, for which the stretch is designated an SPA. The further studies commenced in the short term will be continued and the need for any mitigation measures, such as sediment bypassing or recharge, will be identified.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Long-term:	Due to the high value and extent of socio-economic assets here, the long-term policy option is to continue to hold the line and defend the frontage. This would most likely be provided through maintaining, replacing and upgrading existing structures, although the beach is expected to provide the primary defence to much of the area. With adoption of long-term policy options along other updrift frontages, the beach should be supplied with fresh sediment to remain healthy over the next century. However, although this policy option is considered sustainable for the timescales discussed, in the very long-term (i.e. much greater than 100 years) it is recognised that sea-level rise could make holding the existing line increasingly difficult and expensive. Any beach erosion and steepening could also result in a loss of areas suitable for tern colony nesting, for which mitigation measures may well need to be put in place.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.17: Great Yarmouth (1 of 2)



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2105
- Indicative erosion zone up to 2055
- Policy Unit boundary

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.17: Great Yarmouth (2 of 2)

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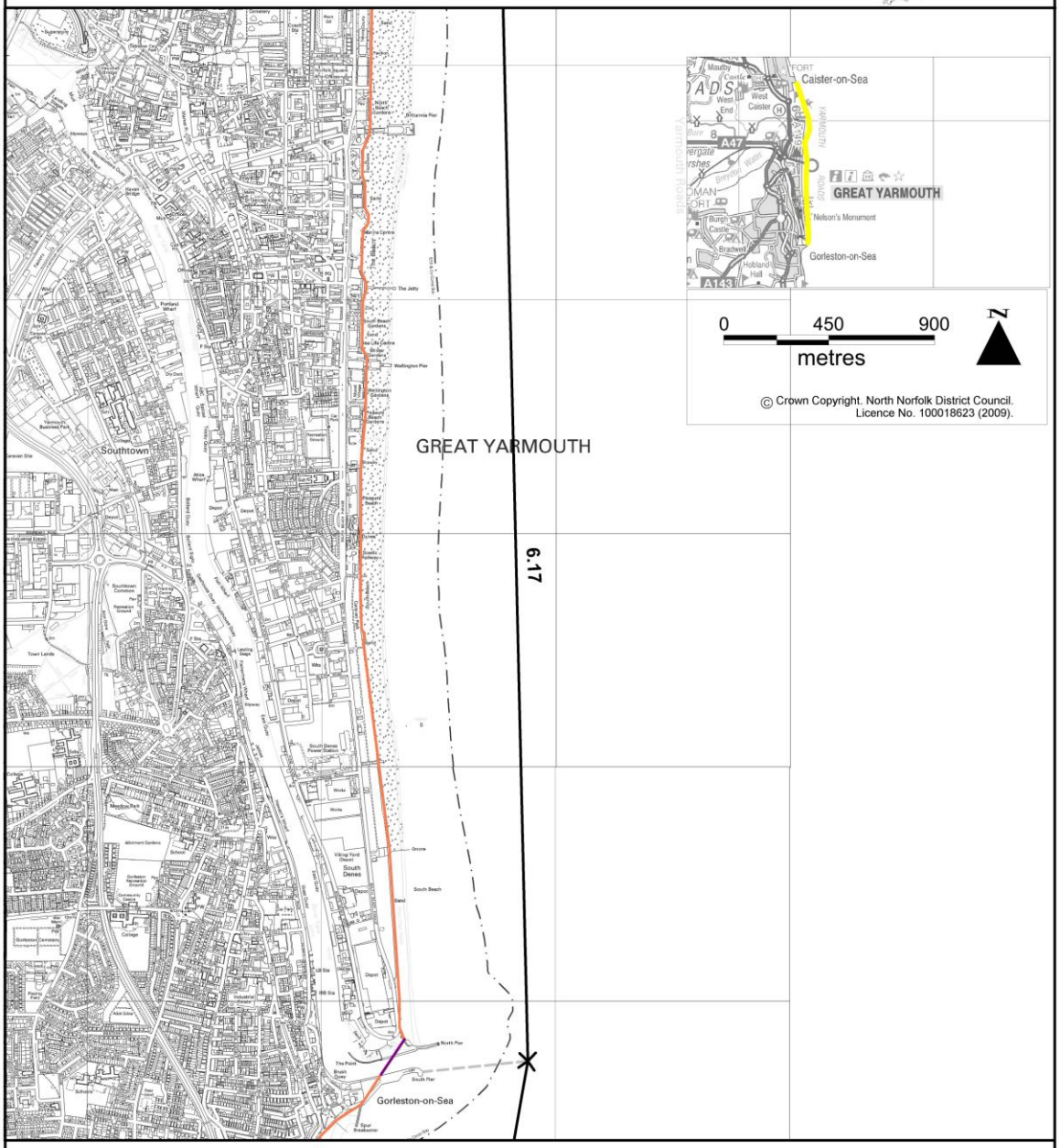


FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Great Yarmouth***
Policy Unit reference:	*6.17*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	No loss of property or land behind the existing defences. No issue with port operation with respect to defences.	Integrity of North Denes SPA and SSSI maintained.	No landscape objectives identified.	No loss of heritage sites behind the existing defences.	No loss of recreational or tourist facilities behind existing defences. No loss of Great Yarmouth and Caister Golf Course or Great Yarmouth race course. Narrower beach and access maintained.
By 2055	No loss of property or land behind the existing defences. No issue with port operation with respect to defences.	Integrity of North Denes SSSI maintained behind the seawall but possible losses of SPA area on seaward side due to system retreat.	No landscape objectives identified.	No loss of heritage sites behind the existing defences.	No loss of recreational or tourist facilities behind existing defences. No loss of Great Yarmouth and Caister Golf Course or Great Yarmouth race course. Narrow beach and access maintained.
By 2105	No loss of property or land behind the existing defences, but potential increased risk of overtopping. No issue with port operation with respect to defences.	Integrity of North Denes SSSI maintained behind the seawall but possible losses of SPA area on seaward side due to system retreat.	No landscape objectives identified.	No loss of heritage sites behind the existing defences.	No loss of recreational or tourist facilities behind existing defences, but increase risk of overtopping for promenade properties (without defence improvements). No loss of Great Yarmouth and Caister Golf Course or Great Yarmouth race course. Little or no beach, particularly at southern extremity.

Location reference:	***Gorleston***
Policy Unit reference:	*6.18*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The position of Gorleston on the coast means it has very little influence or impact upon coastal processes operating elsewhere. It is an important residential, commercial and tourist centre. The long-term policy is therefore to continue to protect assets through holding the present line of defence.

Policies to implement Plan:

From present day: The present-day policy option for this area is to continue to hold the line to protect the town frontage through maintaining and, if necessary, replacing existing defences. This will protect all properties and associated infrastructure.

This approach is consistent with the long-term Plan for this section of shoreline.

Medium-term: In the medium-term there will be no change from the above policy option of hold the line**.** Defence of the frontage would most likely be through maintaining, replacing and upgrading the existing structures.

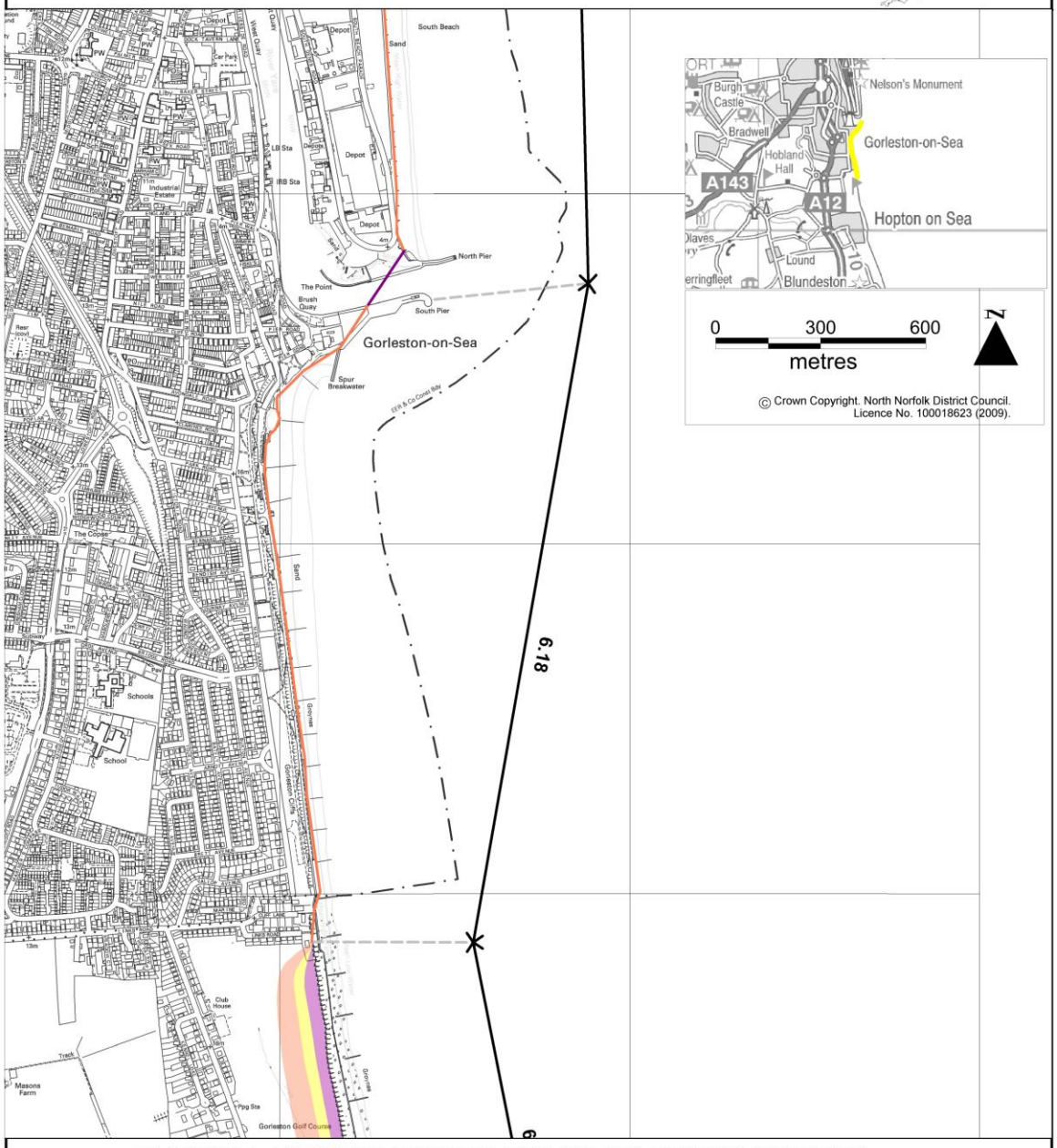
There will, however, be a change in the character of the resort over this period as beach will begin to narrow as a result of sea level rise combined with the restriction of landward movement due to the seawall.

Long-term: The long-term policy option is to continue to hold the line. This will continue to protect assets within the town.

Adoption of policy options to the north and south will provide a supply of sand, but the beach is likely to be very narrow and sporadic at some locations as a result of the greater exposure resulting from sea level rise. A more substantial defence, and therefore greater investment, may be required to provide integrity of defence and works would be required to prevent outflanking due to erosion of the cliffs to the south. This should however be economically justified.

Although this policy option is considered sustainable for the timescales discussed, in the very long-term (i.e. much greater than 100 years) continued defence along this line may eventually become difficult to justify.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.18: Gorleston



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Gorleston***
Policy Unit reference:	*6.18*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	No loss of property, land or infrastructure behind the existing defences. No issue with port operation with respect to defences.	No conservation objectives have been identified, but the possibility for biodiversity enhancement has been recognised through dune management.	No landscape objectives have been identified.	No loss of heritage sites landward of the existing defences.	No loss of community or tourist facilities landward of existing defences. Beach present.
By 2055	No loss of property, land or infrastructure behind the existing defences. No issue with port operation with respect to defences.	No conservation objectives have been identified, but the possibility for biodiversity enhancement has been recognised through dune management.	No landscape objectives have been identified.	No loss of heritage sites landward of the existing defences.	No loss of community or tourist facilities landward of existing defences. Narrow beach present.
By 2105	No loss of property, land or infrastructure behind the existing defences. No issue with port operation with respect to defences. Possible work required to maintain pumping station outlet to sea.	No conservation objectives have been identified, but the possibility for biodiversity enhancement has been recognised through dune management.	No landscape objectives have been identified.	No loss of heritage sites landward of the existing defences.	No loss of community or tourist facilities landward of existing defences, but risk of overtopping of promenade (without defence improvements), particularly along southern section. Very narrow beach present, particularly along southern section.

Location reference:	***Gorleston to Hopton***
Policy Unit reference:	*6.19*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The long-term Plan is for cliff retreat to allow sediment to be sourced from cliff erosion and to pass freely along this frontage. This sediment feed from here is vital to feed beaches and enhance protection to areas north and south, where defence is a priority along this length of coast. It is estimated that erosion of cliffs between Gorleston and Lowestoft provides up to 10% of the total SMP area sediment and frontages along this stretch rely heavily upon this local source of sediment, due to the continued interruption to supply from areas further north within the SMP. Therefore the long-term Plan for this section of coast is to allow retreat, enabling a naturally functioning coast with minimal human interference. This will not result in the loss of any built assets but will have an impact upon the golf course. However, when these defences eventually fail, there will be the potential for outflanking of the sea walls at the southern end of Gorleston and the northern end of Hopton. As a consequence there may be impacts on these defences in the next 10-15 years.

Policies to implement Plan:

From present day:

The policy option is to allow retreat by not maintain existing defences, however some intervention may be required to make safe defences that are no longer effective. The policy is therefore managed realignment. However, the timber revetments along this frontage have an estimated residual life of between 10 and 15 years, so during this period will continue to slow retreat and erosion along the seaward edge of the golf course. These defences will not be replaced as they reach the end of their effective life.

Further investigations will be undertaken to identify technical options and establish an appropriate package of social mitigation measures, to address the potential outflanking of defences in Gorleston and Hopton and subsequent impact on property and people. Where it can be financially justified, minor temporary works (for example placement of areas of rock, beach replenishment etc) may be undertaken at selected areas to slow the rate of coastal erosion, but not with a view to protecting the coast within the management unit into the medium or long term. As and when a suitable package of social, economic and planning measures is identified, maintenance and minor repair of defences will cease, and the coastline will be allowed to continue its natural regression.

This approach is consistent with the long-term Plan for this section of shoreline.

Medium-term:

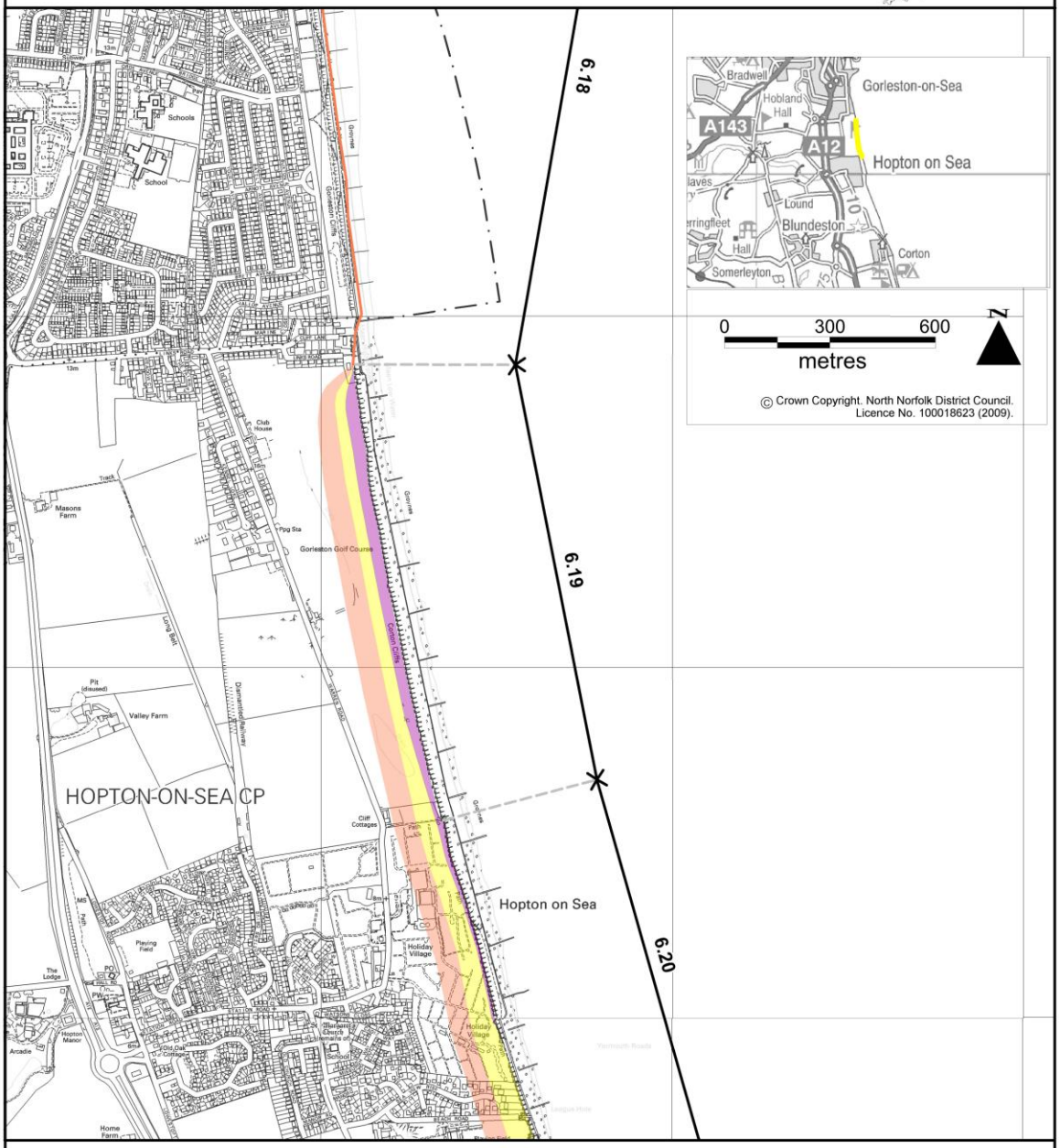
In the medium-term, the policy option is no active intervention, as it is likely that the previous defences will no longer function, and will have been safely removed.. This policy option will begin to have significant technical benefits through providing sediment feed to adjacent frontages.

Long-term:

No change from the medium-term policy option of no active intervention.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.19: Gorleston to Hopton



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Gorleston to Hopton***
Policy Unit reference:	*6.19*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	***Property & Land Use***	***Nature Conservation***	***Landscape***	***Historic Environment***	***Amenity & Recreational Use***
By 2025	Loss of golf course land, including holes.	No nature conservation objectives identified.	No landscape objectives identified.	No heritage objectives identified.	No objectives identified, other than the golf course.
By 2055	Further loss of golf course.	No nature conservation objectives identified, but naturally functioning coast promoted.	No landscape objectives identified.	No heritage objectives identified.	No objectives identified, other than the golf course.
By 2105	Further loss of golf course.	No nature conservation objectives identified, but naturally functioning coast promoted.	No landscape objectives identified.	No heritage objectives identified.	No objectives identified, other than the golf course.

Location reference:	***Hopton***
Policy Unit reference:	*6.20*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

There is a requirement to avoid a promontory being formed along this section, which would impact on the sediment supply along this coast and be detrimental for the defence of adjacent areas. Therefore in the ultimate policy which will need to be implemented, possibly beyond the timeline of this plan, will be no active intervention, This would improve sediment input and throughput. However, this policy can only be put in place once measures to offset social impacts have been implemented, and existing defence ruins made safe. Social impacts could result from effects on seafront properties at Hopton; therefore measures need to be put in place to manage the risk and potential relocation/ mitigation of loss of properties and land. Due to the seafront assets, it is recommended that this retreat be managed through continued maintenance of existing defences, whilst technically and economically acceptable.

Policies to implement Plan:

From present day: The policy option for the immediate future is to hold the line and to continue to defend the coast through routine and reactive maintenance of the existing defences until they reach the end of their effective life (i.e. minor repairs may be carried out during this period). However, these defences would not be enhanced or replaced. With maintenance, the concrete seawall along the southern section of this frontage is estimated to have a residual life of 15 to 20 years, although the timber revetment and groynes may fail before this. This policy option will continue to protect assets so that measures can be put in place to manage or mitigate for loss.

In parallel, investigations will be undertaken to identify technical options and establish an appropriate package of social mitigation measures, in preparation for the transition to the long term policy aim. Only when such adequate mitigating social measures are identified to limit the impact on the lives of individuals and the community, would the change to managed realignment be implemented.

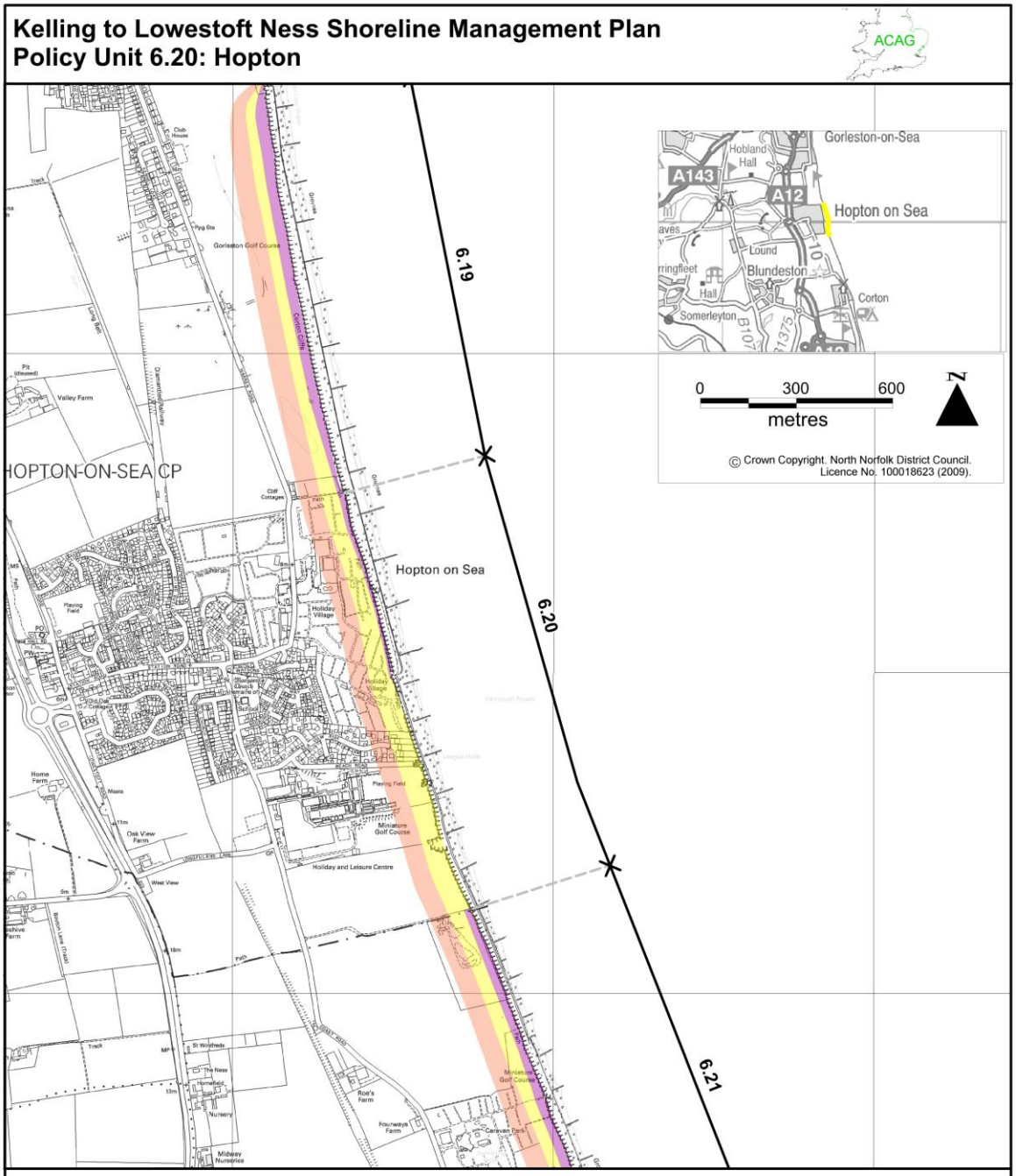
Medium-term: Once the existing defences fail, it would be neither economically viable nor technically appropriate to replace them with similar structures. There is also a need to ensure sediment input to adjacent shorelines to enhance defence there. However there may be a need to undertake minor works to slow the rate of erosion to allow time for social mitigation measures to be implemented, The measures investigated in the short term period of the plan will need to be in place to manage the impact on individuals and community that may result from the eventual loss of cliff top land and a number of (mainly holiday) properties. The policy option must also allow for the removal of defence ruins. Therefore the medium-term policy option is to allow the coast to retreat, but through a policy option of managed realignment.

This policy option will not be detrimental to the long-term Plan due to the rapid nature of shoreline response along this coastline once defences are no longer in place.

Long-term: The long-term policy option is to allow coastal retreat, but to continue to do this via managed realignment to ensure a sediment supply to this and downdrift frontages, where the material from cliff erosion is necessary to allow beaches to build. There could, however, be continued loss of cliff-top properties and associated facilities but this would have been planned for under the social mitigation measures.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.20: Hopton



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Hopton***
Policy Unit reference:	*6.20*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	***Property & Land Use***	***Nature Conservation***	***Landscape***	***Historic Environment***	***Amenity & Recreational Use***
By 2025	No loss of cliff top land or property.	No nature conservation objectives identified.	No landscape objectives identified.	No heritage objectives identified.	No loss of community or tourist facilities. Beach present, but likely to be narrower.
By 2055	Loss of less than 5 seafront properties and heart of village not affected by erosion. Loss of seafront tourist accommodation and associated infrastructure.	No nature conservation objectives identified, but promotion of naturally-functioning coast.	No landscape objectives identified.	No heritage objectives identified.	Heart of village not affected by erosion – but playing fields lost along coastal strip. Loss of tourist facilities associated with Holiday village. Loss of promenade. Beach present, but existing access lost.
By 2105	Cumulative loss of less than circa 15 seafront properties, but heart of village not affected by erosion. Further loss of seafront tourist accommodation and associated infrastructure.	No nature conservation objectives identified, but promotion of naturally-functioning coast.	No landscape objectives identified.	No heritage objectives identified.	Heart of village not affected by erosion – further loss of tourist and recreational facilities along seafront. Loss of promenade. Beach present, but existing access lost.

Location reference:	***Hopton to Corton***
Policy Unit reference:	*6.21*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The long-term Plan is for retreat to allow sediment to be sourced from cliff erosion and to pass freely along this frontage. The sediment from here is vital to feed beaches and enhance protection to areas north and south, where defence is a priority along this length of coast. It is estimated that erosion of cliffs between Gorleston and Lowestoft provides up to 10% of the total SMP area sediment and frontages along this stretch rely heavily upon this local source of sediment, due to the continued interruption to supply from areas further north within the SMP. Therefore the long-term Plan for this section of coast is to allow cliff retreat, enabling a naturally functioning coast with minimal human interference. The timber revetments and groynes have failed and there is subsequent erosion of the cliff. Part of the concrete seawall at the northern end of this unit collapsed in October 2009. Full failure of this part of the seawall is expected to occur in the near future which will result in erosion of the cliff behind. However, as there are some socio-economic assets that would be affected by this policy option, including one residential property, the preferred policy option is managed realignment, but only to allow removal of ruined defences.

Policies to implement Plan:

From present day: The approach is to not maintain existing defences, but through a policy option of managed realignment, to allow defunct defences to be managed. During this period the defences will not be maintained and although they may continue to slow erosion for a short while, they will eventually cease to function. These defences will not be replaced. Consideration will be given to removing defunct defences where these pose a risk to public safety, or a significant impact on the landscape. In addition, a disused MoD bunker may start to be exposed in this epoch, and its management will need to be considered in the update of the coastal strategy. There will be loss of agricultural and caravan park land over this period.

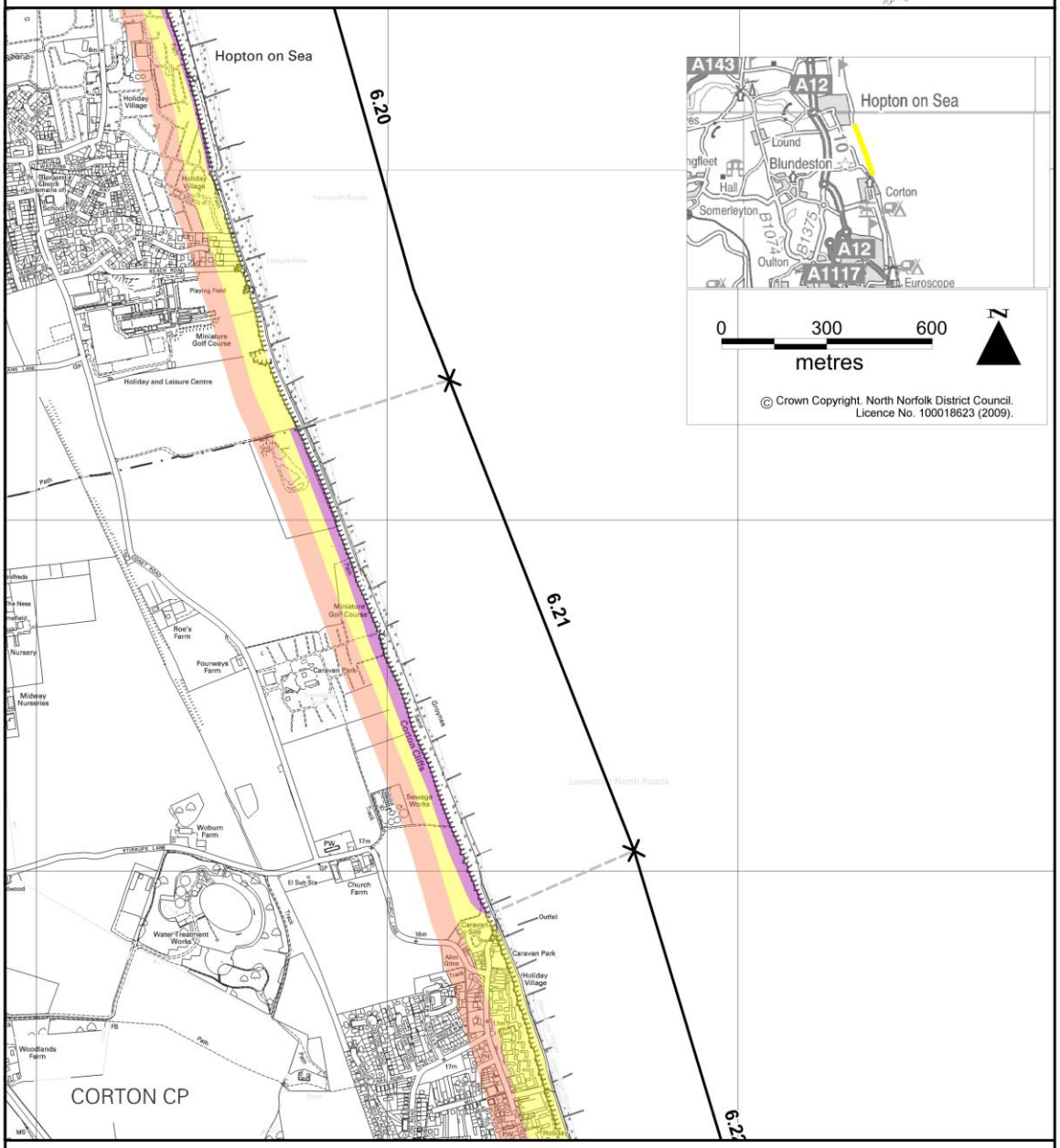
Further investigations will be undertaken to establish an appropriate package of social mitigation measures, to address the potential impact on the lives of individuals that may be affected, in the long term, in particular the occupants of the single residential property. *This approach is consistent with the long-term Plan for this section of shoreline.*

Medium-term: There will be a policy of managed realignment, unless and until all defunct defences have been removed, in which case the policy will change to no active intervention. This policy option will enable a naturally-functioning coastline to operate, with cliff inputs maintaining a beach along this frontage and feed beaches to the south. There will be loss of agricultural and caravan park land and possibly one residential property close to the boundary with the PU20. The residential property risk will be influenced by the approach to management of defences at the junction with the frontage to the north. Measures put in place in the short term will help to mitigate any socio-economic impacts resulting from this policy option.

Long-term:	No change in policy option from no active intervention. This will continue to assist the defence of other frontages.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.21: Hopton to Corton



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Hopton to Corton***
Policy Unit reference:	*6.21*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	Loss of Grade 2 agricultural land. No loss of Broadland Sands main resort, but loss of land.	Naturally-functioning coast. Possible habitat improvement.	Exposed bunker and defunct defences may be unsightly.	No heritage objectives identified.	Beach inaccessible due to defence ruins.
By 2055	Possible loss of 1 residence. Further loss of Grade 2 agricultural land. Further loss of Broadland Sands land.	Naturally-functioning coast. Possible habitat improvement.	No issues subject to removal of MoD bunker and defunct defences.	No heritage objectives identified.	Assuming failed defences are removed – the amenity beach will be restored. Access to beach will need proactive management.
By 2105	Total loss of Grade 2 agricultural land of up to approximately 25 hectares. Further loss of Broadland Sands land, including existing pitches. Loss of some of the Pumping Station site.	Naturally-functioning coast. Possible habitat improvement.	No issues subject to removal of MoD bunker and defunct defences.	No heritage objectives identified.	Assuming failed defences are removed – the amenity beach will be restored. Access to beach will need proactive management.

Location reference:	***Corton***
Policy Unit reference:	*6.22*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The exposure of this coastline means that technically it is already becoming increasingly difficult to hold the present shoreline position, with beaches becoming almost impossible to retain. This is due to the prominent position of this frontage, relative to the shoreline either side, with it being some distance forward of its natural position. There is also insufficient economic justification for providing defence against ongoing erosion. Continued defence at this location will also increasingly interrupt sediment movement along this coastline, which will be to the detriment of Gunton Warren and Lowestoft. The long-term Plan for Corton is therefore to allow the cliffs to retreat, allow a more natural shoreline position to be attained. However, there will be loss of property and associated infrastructure within the village; therefore it may be acceptable to manage this retreat where this can be economically justified and is not detrimental to processes and environmental gains. Notwithstanding this, measures to manage risk and mitigate the displacement of people and loss of property and assets will need to be developed and put in place.

Policies to implement Plan:

From present day: The policy option in the short term is to hold the line to protect the village frontage through routine and reactive maintenance of the existing defences, i.e. the rock armour, sea wall and cliff slope protection, where this is physically possible, and funding allows. The actual timing of wall failures is estimated to be between 2025 and 2030, but to comply with the long-term Plan they would not be replaced should there be a major failure in advance of that date.

This approach will minimise cliff erosion, and should continue to protect assets within the village. However, any measures to accommodate changes in defence practice and loss of property in the medium-term need to be established during this period. Investigations will thus be undertaken to identify technical options and an appropriate package of social mitigation measures, in preparation for the transition to the medium to long term policy option of managed realignment (see sections below). Only when such adequate mitigating social measures are identified, which will limit the impact on the lives of individuals and the community, would the long-term change to a managed realignment policy option be implemented. These measures will need to consider the predicted loss of The Street in the long term. The Coastal Strategy will need to identify various responsibilities for addressing the future loss of infrastructure (access, sewers, gas etc) including the effect on properties in the hinterland.

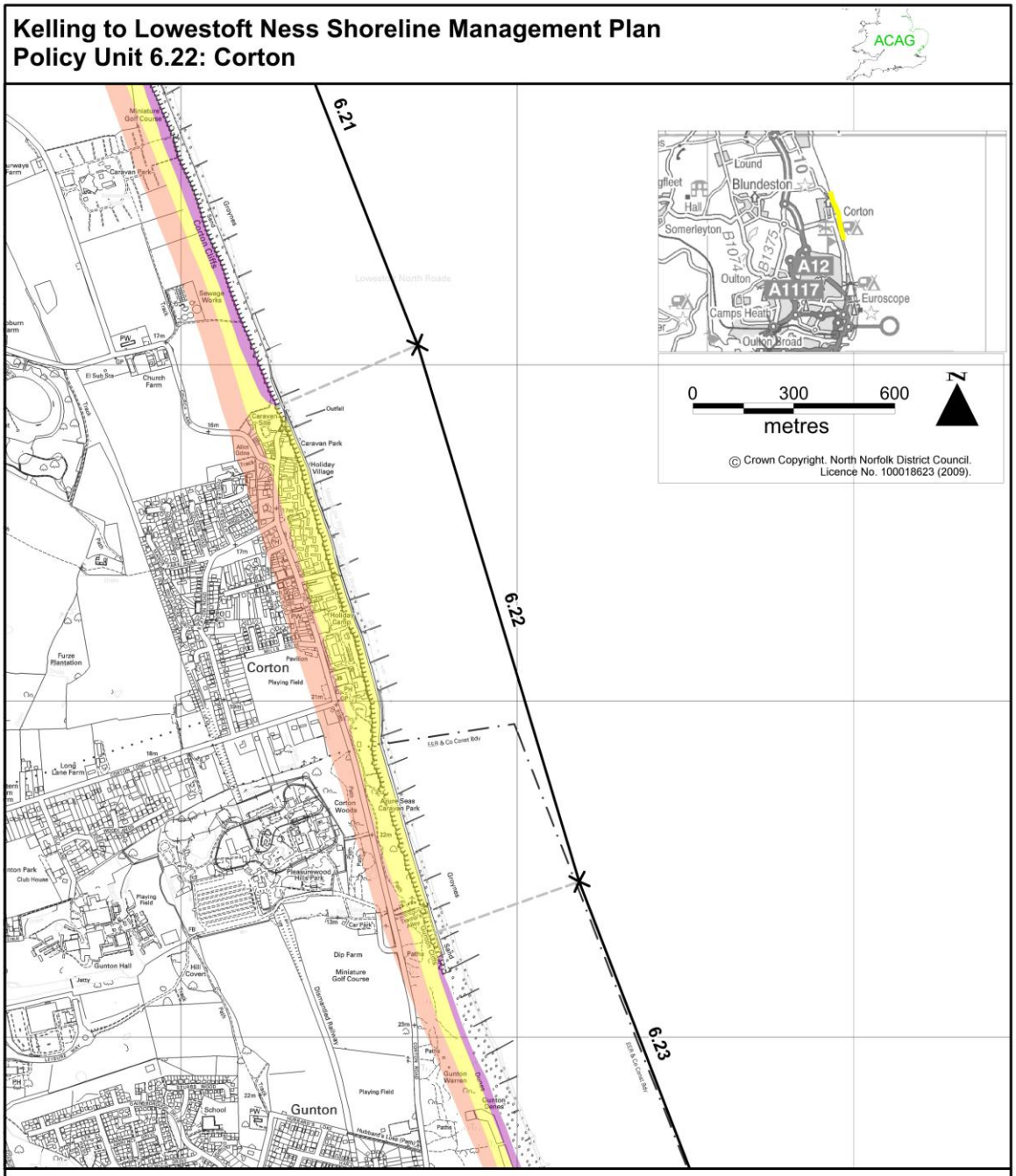
This short term policy option is not detrimental to the achievement of the long-term Plan, as it is expected that coastal response in the absence of defence would be rapid.

Medium-term: The maintenance of defences along this frontage will become more difficult, and therefore much more expensive, as the Corton coast continues to develop as a promontory and becomes more exposed. It will also be detrimental to

	achievement of a naturally functioning shoreline. The medium-term Plan is therefore to cease maintenance of the defences and allow cliff erosion so that a more natural shoreline (i.e. less of a promontory) is achieved. Management of the abandoned defences may be a key influence in the delivery of strategic benefits and will also impact upon beach access opportunity. There will be loss of cliff top assets of up to 40 properties under this policy option; therefore a requirement will be for measures identified in the short term stage of the plan to be put in place prior to this time that will enable appropriate relocation of people, properties and facilities. To achieve the Plan the shoreline needs to reach a position generally in line with shoreline on either side. As the shoreline erodes towards that position, there may be justification for occasional intervention to help manage the retreat. Defence measures that temporarily slow (rather than halt) erosion are likely to be acceptable, provided that these do not prevent the alongshore transport of beach sediment and do not result in the development of this area as a promontory, i.e. phases of retreat should be allowed for. Therefore the policy option is to allow retreat through managed realignment.
Long-term:	In the long-term the policy option is to allow cliff retreat. This will deliver technical and environmental benefits, but a number of assets will be lost, with over 100 properties being lost; however the commitment to social mitigation measures developed in the short term will lessen the socio-economic impact of this policy option. As the shoreline reaches a position more in line with the adjacent cliffs, beaches should be healthier and it is expected that erosion rates would slow. As a result, management of the shoreline could be more easily achieved, through measures such as groynes, without being detrimental to adjacent areas. Therefore the policy option is to allow retreat through managed realignment.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.22: Corton



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Corton***
Policy Unit reference:	*6.22*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	*Property & Land Use*	*Nature Conservation*	*Landscape*	*Historic Environment*	*Amenity & Recreational Use*
By 2025	No loss of property or land behind the existing defences.	No variance; continued exposure of SSSI cliffs.	No landscape objectives identified.	No loss.	Little/ no beach present – no change in beach access. No loss of community or recreational facilities landward of defences.
By 2055	Loss of less than circa 20 houses and less than circa 20 commercial properties and associated infrastructure/ services. Coast Road (the Street) will be severed. Loss of seafront caravan sites/ holiday camps.	Improved exposure of SSSI cliffs and sediment linkage alongshore.	No landscape objectives identified.	Some loss of high importance area seaward of Corton Church.	Narrow beach retained but relocation of access required. Opportunity for and quality of use will depend upon how defence debris is managed after failure. Loss of some seafront facilities.
By 2105	Cumulative loss of less than approximately 90 houses and less than 25 commercial properties and associated infrastructure/ services. Loss of Methodist Church, school, village hall and Public House. Further loss of seafront caravan sites/ holiday camps. Further loss of main coast road.	Naturally functioning system. Improved exposure of SSSI cliffs and sediment linkage alongshore.	No landscape objectives identified.	Further loss of high importance archaeological area.	Narrow beach retained but relocation of access required. Loss of further seafront facilities.

Location reference:	***Corton to Lowestoft***
Policy Unit reference:	*6.23*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

The long-term aim is for a naturally-functioning coast through allowing retreat, as there are few socio-economic assets along this frontage. A concern, however, is the possible erosion of the Eleni V oil dump sites and the associated pollution risk; therefore some measures to slow the erosion may be appropriate in the long-term. There are similar concerns regarding exposure of sewage and waste water return pipes, which traverse this area. In the long-term the coastal road, linking Corton to Lowestoft will also be at risk of erosion. As there are limited advantages of allowing sediment throughput onto the Lowestoft Ness frontage, there may be some technical justification to introduce measures to slow (rather than halt) erosion.

Policies to implement Plan:

From present day:	In the short term the policy option is to allow retreat through managed realignment, i.e. no longer maintain existing defences; however defence ruins will require management and eventual removal. There are few economic assets along the cliff top therefore there would be no economic justification to maintain defences. However, due to the risk of exposure of both the Eleni V oil dump sites and the sewage pipes, measures to manage the risk require investigation. *This approach is consistent with the long-term Plan for this section of shoreline.*
Medium-term:	Assuming defunct defences, the oil dump and sewage pipelines have been made safe in the first epoch, the policy option will be no active intervention in the medium term.
Long-term:	No change from the above policy option of no active intervention. As noted above, risk management measures may need to be in place and measures to slow erosion may be justified if assets are threatened by erosion.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.23: Corton to Lowestoft

FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2105
- Indicative erosion zone up to 2055
- Policy Unit boundary

Location reference:	***Corton to Lowestoft***
Policy Unit reference:	*6.23*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	***Property & Land Use***	***Nature Conservation***	***Landscape***	***Historic Environment***	***Amenity & Recreational Use***
By 2025	No implications predicted, assuming defences, oil dump and sewage pipelines are made safe	Some loss of CWS due to dune erosion. Naturally-functioning coast.	No landscape objectives identified.	No heritage objectives identified.	Beach present with access remaining. Loss of recreational area/ public open space.
By 2055	No implications predicted, assuming defences, oil dump and sewage pipelines are made safe	Loss of CWS due to dune erosion. Naturally-functioning coast.	No landscape objectives identified.	No heritage objectives identified.	Beach present, but access to beach will need proactive management Further loss of recreational area/ public open space.
By 2105	No implications predicted, assuming defences, oil dump and sewage pipelines are made safe	Possible exposure of sand cliffs therefore potential for habitat creation. Naturally-functioning coast.	No landscape objectives identified.	No heritage objectives identified.	Beach present, but access to beach will need proactive management Further loss of recreational area/ public open space.

Location reference:	***Lowestoft North (to Ness Point)***
Policy Unit reference:	*6.24*

SUMMARY OF PLAN RECOMMENDATIONS AND JUSTIFICATION

Plan:

Lowestoft is a key area of industry and commerce. The long-term Plan is to continue to protect assets within the town through defending the present position. The character of this frontage is however expected to change: the present shingle beach is currently eroding and this may in part be due to sediment supply from the north, however the presence/absence of a beach at this location is cyclical in nature and is influenced by the offshore sandbank system. Although the beach is expected to completely disappear in the short term, requiring significant work to maintain the integrity of the built defences, the cyclical nature of the erosion and accretion may mean that this loss is not irreversible.

Policies to implement Plan:

From present day:

The present-day policy option for this area is to continue to hold the existing line to protect the town frontage, through maintaining existing seawalls and groynes; this is economically viable due to the large value of assets at risk both in this cell and in the adjoining cell of plan (SMP7). There may be a need to replace and upgrade the derelict timber defences along the frontage and also to remove older defunct sea walls that may present a navigation hazard.

This policy option will protect existing assets, but over this period, beaches will start to become narrower and defences more exposed.

This is consistent with the long-term Plan for this section of shoreline.

Medium-term:

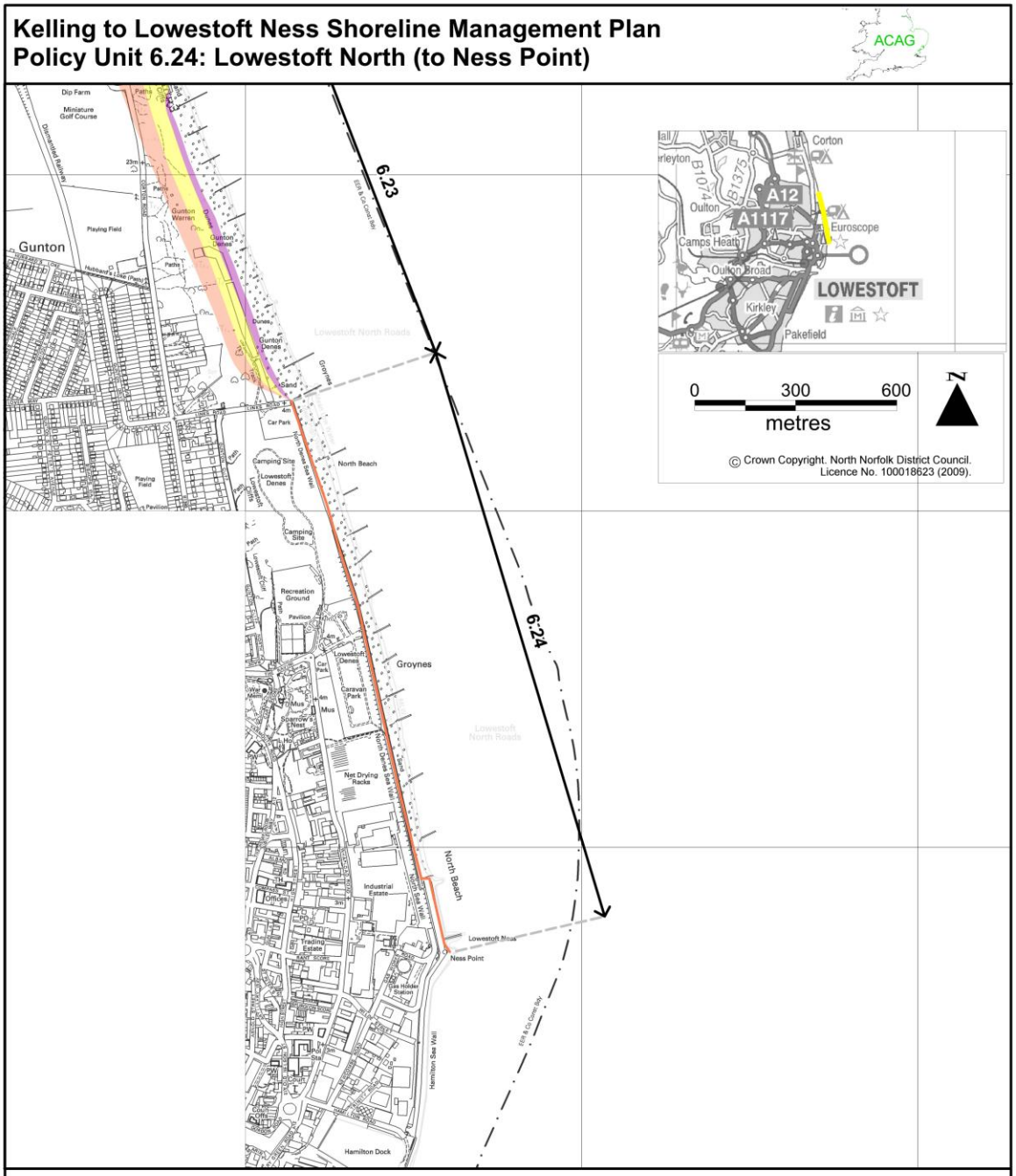
No change from the above policy option, i.e. hold the line. It is likely, however, that the defences will require substantial investment in order to maintain their integrity.

Long-term:

No change from the above policy option, i.e. hold the line. It is likely, however, that the defences will require considerable investment to improve them and thus maintain their integrity. In the very long-term, possibly beyond the period of time considered in this plan, it may become more difficult to justify continuing this policy option. At this stage it may be appropriate to consider alternative policy options that could involve realigning the existing defence line to a more sustainable position, however the feasibility and suitability of this policy option would need to be explored further by undertaking a wide ranging analysis of economic, technical, social and environmental issues.

The above provides the local details in respect of the SMP-wide Plan; therefore the above must be read in the context of the wider-scale issues and policy implications, as presented in the preceding sections and Appendices to this Plan document.

Kelling to Lowestoft Ness Shoreline Management Plan
Policy Unit 6.24: Lowestoft North (to Ness Point)



FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT

Indicative Erosion Zones Based on Current Policy Aims

- Indicative erosion zone up to 2025
- Indicative erosion zone up to 2055
- Indicative erosion zone up to 2105
- Policy Unit boundary

Location reference:	***Lowestoft North (to Ness Point)***
Policy Unit reference:	*e.g. 6.24*

PREDICTED IMPLICATIONS OF THE PLAN FOR THIS LOCATION

Time Period	***Property & Land Use***	***Nature Conservation***	***Landscape***	***Historic Environment***	***Amenity & Recreational Use***
By 2025	No loss of property or land behind the present defences. No loss of infrastructure, including sewerage infrastructure. No risk of exposure of waste site.	No conservation objectives identified.	No landscape objectives identified.	Fishing nets heritage area protected.	No loss of tourist facilities behind the existing defences. Narrow beach present. Lowestoft Ness maintained as most-easterly point.
By 2055	No loss of property or land behind the present defences. No loss of infrastructure, including sewerage infrastructure. No risk of exposure of waste site. There may be some increase in flood risk via the harbour.	No conservation objectives identified.	No landscape objectives identified.	Fishing nets heritage area protected.	No loss of tourist facilities behind the existing defences, but promenade more exposed to overtopping and flooding. No beach present. Lowestoft Ness maintained as most-easterly point.
By 2105	No loss of property or land behind the present defences. No loss of infrastructure, including sewerage infrastructure. No risk of exposure of waste site. Flood risk via the harbour will continue to increase	No conservation objectives identified.	No landscape objectives identified.	Fishing nets heritage area protected.	No loss of tourist facilities behind the existing defences, but promenade more exposed to overtopping and flooding. No beach present. Lowestoft Ness maintained as most-easterly point.

6 Action Plan

6.1 INTRODUCTION

The Kelling to Lowestoft Ness SMP identifies the short term, medium-term and long term policy options for each stretch of coast. Some of these policy options will be relatively straightforward to implement, but others potentially require a great deal of preparation in the form of data collection, research or supporting investigations. This Action Plan describes some of the actions that will be required to deliver the policy options. These actions include:

- developing and implementing engineering solutions;
- modifying planning policies; and
- researching, discussing and implementing social mitigation measures.

Some of these actions will be site-specific; others might more effectively be undertaken at the level of the coastal cell. Some actions might only involve one operating authority; others may benefit from collaboration between coastal authorities. In some cases the required actions will comprise the delivery of 'tried and tested' solutions; others will involve the development of new measures. The effectiveness of many actions will depend upon the proper engagement and involvement of wider groups of stakeholders.

Identifying and developing appropriate social mitigation measures will be particularly important for many policy units. An inclusive approach to exploring and prioritising such measures and facilitating their delivery will be essential. This means that both deliverers (e.g. planners and operating authorities) and representatives of the full range of potentially affected stakeholders will need to be fully involved in the process. Coastal adaptation is a new and evolving area of work still requiring much discussion. Achieving consensus, agreeing measures and developing delivery strategies will take time. It is therefore important that discussions are started early.

6.2 ACTION PLAN OBJECTIVES

Taking the above requirements into account, the objectives of the Kelling to Lowestoft Ness Action Plan are to:

- Facilitate implementation of the SMP policy options
- Identify and promote any investigations or research needed to further understanding where this is needed to resolve/support the delivery of policy options in a sustainable manner
- Promote the delivery of the SMP policy options and other recommendations through spatial planning and development control
- Develop procedures (where necessary) for the management and implementation of the SMP until its next review
- Establish a framework to monitor progress (against this Action Plan) and initiate future reviews as appropriate.
- To provide support for policy setting in SMP3

As far as possible, these objectives should be achieved by taking a common approach to coastal spatial planning, social mitigation, consultation and policy option delivery throughout the coastal cell.

The following sections describe the actions needed to ensure that the SMP recommendations are taken forward in the immediate term through planning and coastal defence/engineering actions, and that the social mitigation actions needed to ensure delivery of the longer term objectives are initiated.

The Action Plan therefore focuses on those actions needed within the period up to the next review of the SMP (usually a 5-10 year period). Where feasible or practicable, longer term actions are also discussed.

6.3 PREPARING FOR A NEW POLICY OF MANAGED REALIGNMENT OR NO ACTIVE INTERVENTION

As indicated above, coastal adaptation (including associated strategic planning and social mitigation measures) is an evolving discipline. The development and implementation of such measures will therefore necessarily be phased over a number of years. For Policy Units where the SMP policies mean it is necessary to prepare for a new policy of managed realignment or no active intervention, the Action Plan anticipates a phased approach to implementation. The generic features of this approach are described in Table 6.1 below.

The initial actions associated with the planning policy and social mitigation aspects of this table are explained further in Section 6.4 below. As more specific actions are identified in future (for example, actions relevant to particular planning units or local authority areas) these will need to be presented differently. The engineering activities highlighted in Table 6.2 are then elaborated in Section 6.5.

Table 6.1 Approach to preparing for managed realignment or no active intervention in Policy Units where coastal defences are actively maintained

	Engineering activities	Planning policy	Social mitigation
Short term	Continue works as necessary to hold the line	Introduce policies to prevent or manage new development in defined risk area; to facilitate relocation of certain land uses. Develop/implement policies to limit blight	Explore and discuss potential social mitigation measures; identify priorities at cell-wide or Policy Unit level
Short-medium term	As required, undertake minimum works necessary to sustain defence e.g. following partial failure	Implement above policies through development control; consider other initiatives (e.g. a rolling buffer strip for future application of preventative policies)	Develop and secure funding for social mitigation measures identified.
Medium to longer	Withdraw maintenance	Consider additional	Implement and monitor

term	activities; manage then remove defence debris.	planning policy requirements (to include climate change adaptation)	social mitigation measures
Long term	No active intervention or maintenance of realigned defence	Review and revise planning policy to take account of natural coastal evolution	Review monitoring outcomes and if necessary modify suite of measures for ongoing application

6.4 THE ACTION PLAN

6.4.1 Action Categories

The actions identified fall into four main categories, some of which can be divided into sub-categories. A summary of the action references, showing their appropriate categories, is provided in Table 6.2.

Table 6.2 Action Plan References by Category

Preparatory and Supporting Actions			Data and monitoring	Local Initiatives				Associated Actions
Social Mitigation	Planning Policy	Methods and tools		Studies	Strategies	Planning	Works	
G/03	G/01	G/02	EA/01	EA/06	NNDC/03	NNDC/15	EA/04	G/17
G/04	G/07	G/11	EA/02	EA/07	NNDC/07		EA/05	
G/05	G/10	G/12	EA/03	EH/01	WDC/02		GYBC/02	
G/06	G/18		G/13	GYBC/04			GYBC/03	
G/08	G/19		GYBC/01	HRA/02			NNDC/05	
G/09			HRA/01	HRA/03			NNDC/06	
G/14			NNDC/01	HRA/04			NNDC/09	
G/15			NNDC/04	NNDC/02			NNDC/10	
G/16			WDC/13	NNDC/08			NNDC/11	
WDC/01			WDC/14	WDC/05			NNDC/12	
WDC/10			WFD/01	WDC/07			NNDC/13	
			WFD/06	WFD/02			NNDC/14	
				WFD/03			WDC/03	
				WFD/04			WDC/04	
				WFD/05			WDC/06	
							WDC/08	
							WDC/09	
							WDC/11	
							WDC/12	
							WDC/15	
							WDC/16	
							WDC/17	
							WDC/18	

6.4.2 Preparatory and Supporting Actions

The majority of these actions can be applied generally to the entire coastal cell. Insofar as these actions are concerned, a coordinated approach will help to ensure consistency in respect of a number of key issues. Such an approach is also likely to prove significantly more cost-effective as resources can be shared and duplication avoided. The preparatory and supporting actions can be subdivided into three categories i.e.

Social mitigation actions,

The need to identify, and facilitate the implementation of social mitigation where possible, is fundamental to the success of the policy options put forward in this SMP. In order to take this vital part of the process forward a number of actions specifically linked to social mitigation are presented in the action plan.

Planning policy actions

The risk management policy options set out in the SMP cannot be implemented through coastal defence management alone. There is a need for spatial planning to adopt the policy options and understand their consequences, such that risk areas are avoided by development, and future changes in policy are facilitated. Table 6.3 includes actions which aim to ensure that the SMP policy options are appropriately reflected in the relevant Regional Plan and Local Development Frameworks (such that long term coastal erosion and flooding risks are a material consideration in the planning process). Again the relative priorities of these actions are indicated.

Methods and tools.

Some of the actions identified require a new and consistent methodology to be developed and agreed. These include methods for the consideration of social mitigation and local economic factors in future studies and others relate to future exit strategies being consistently applied.

6.4.3 Data and Monitoring

The future studies, strategies and works, as well a future reviews of the SMP will need to be underpinned by good and well managed data. Monitoring of the shoreline is necessary to identify ongoing behaviour, together with targeted study/investigation where specific aspects need to be addressed to enable Plan implementation. These aspects will include a wide range of issues such as social and economic consequences and potential impacts on areas of habitat of European importance.

In this area, the entire frontage is routinely monitored as part of the Anglian Coastal Monitoring Programme, led by the Environment Agency. Data collected from this monitoring programme will be used to review predicted cliff retreat rates and provide information for future updates of the SMP, continually improving certainty in the shoreline evolution and extent of erosion that may be expected.

6.4.4 Local Initiatives

Local initiatives are those that are not applicable cell wide and are identified to address issues associated with a particular section of the coast within the cell. Three main sub-categories have been identified as follows:

Studies

A number of studies are required in order to address specific questions about the coast, including the dynamics of various habitats, coastal processes, and potential hazards that could be exposed by a retreating coastline.

Strategies

Coastal strategies will be prepared that cover all lengths of the coast within the SMP area. These will consider the need for defences, but will also incorporate an analysis of the potential consequences of a change of policy to Managed realignment or No Active Intervention, where this is proposed within the SMP.

Works

There are areas where new works, or continued maintenance of existing defences, are necessary or likely to be required. Improved or replacement defences will usually require a Project Appraisal Report (PAR) to be prepared in order to secure funding.

6.4.5 Associated Actions

Only one action has been identified that is not directly associated with the other categories and this relates to the need for all future studies and works to take into account the requirements of the Coastal Access Act 2009.

These studies/initiatives and the actions for the Coastal Group are outlined in Table 6.3, together with their priority.

Table 6.3 SMP Action Plan

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Planning Policy	**G/01**	**All**	**Cell Wide**	Submit SMP to Local Authority Planning Committees with recommendation to approve the SMP for consideration in preparation of planning documents and for development control purposes.	The SMP must be adopted in order for it to have the appropriate impact on the Local Development Framework (LDF), and influence planning decisions.	All	Jan-11		Feb-11		All	NNDC, GYBC, WDC, EA		H	H
Methods and Tools	**G/02**	**All**	**Cell Wide**	Identify a standard approach to the assessment of social, economic and environmental sustainability for inclusion in the scope of Coastal Strategies.	A simple but robust methodology is required to enable an assessment to be made of the social, economic and environmental consequences of changing from a policy of defence or active management to managed realignment or no active intervention (referred to as transitional policies). Such a methodology would *inter alia* assess whether there are overriding reasons to modify the policy, confirm social mitigation requirements, and establish whether the policy will be sustainable. Various criteria will determine the point in time at which a policy is considered to be unsustainable and a transition to the next policy option is required. These criteria will need to be outlined in the methodology which will need to make reference to national guidelines and indicators relating to sustainability. It is recognised that the sustainability indicators used are likely to be qualitative rather than quantitative, which makes it very important that they are developed in agreement with the key stakeholders. A requirement to implement this type of study should be included in the brief for each coastal management strategy study, and all sections of coast should be included in one or other of the strategy studies identified for Cell 6.	WDC/05	Feb-10	Feb-10	Jan-11	Various	EA	NNDC, GYBC, WDC,		H	H
Social Mitigation	**G/03**	**Units where there is a change of policy option.**	**Cell Wide**	Investigate and report on potential social mitigation measures, focussing on deliverability and responsibility.	Many of the policy options in the Kelling to Lowestoft Ness SMP require appropriate social mitigation measures to be identified and (where such measures are the responsibility of the coastal operating authorities) implemented before a policy change can be justified. A joint investigation should therefore be undertaken to identify the full range of social mitigation options and to explore: 1) which organisation(s) would likely be responsible for their delivery; and 2) whether any changes (e.g. in legislation) would be needed at national level before they could be implemented locally. This action will include a review of national policy/legislation and take into account the Defra Coastal Change Policy, and the findings of the resulting pathfinder studies.	G/04, G/08	Jun-10		Jun-11		NNDC	EA, GYBC, WDC		H	H
Social Mitigation	**G/04**	**Units where there is a change of policy option.**	**Cell Wide**	Engage local community representatives in prioritising potential social mitigation measures.	Effective engagement of local stakeholders will be critical in determining which measures, out of the full suite of potential social mitigation measures identified, are likely to be most appropriate given the particular characteristics of the Policy Units within the Kelling to Lowestoft Ness cell. This process would also need to take into account the factors identified above (i.e. responsibility for delivery; required legislative changes; etc.). Discussions to agree local priorities could take place through a series of workshops based around existing forums for discussion (e.g. Parish Council meetings).	G/03, G/08, G/06	Aug-10		Jun-11		NNDC	EA, GYBC, WDC		H	H

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Social Mitigation	**G/05**	**All**	**Cell Wide**	Ensure that all Actions within this action plan take into account the findings of the Coastal Pathfinder Studies as soon as they become available.	The findings of the the pathfinder studies will provide useful information to inform a number of other studies and strategies promoted within this action plan.	All	May-11		Jun-12		NNDC	EA, GYBC, WDC		H	M
Social Mitigation	**G/06**	**All**	**National**	Seek Central Government funding for all consultation/stakeholder activities in the development of SMPs and strategies/ schemes.	In order to take the SMP forward it will be essential to maintain the involvement of the wider community and other stakeholders, to a greater degree than has been the case previously.	G/15	Jun-10		Jun-12		EA	NNDC, GYBC, WDC		M	M
Planning Policy	**G/07**	**All**	**Cell Wide**	Inform Local Authority Planning Officers of final SMP recommendations and implications	Methods will need to be agreed for effective communication. These may include giving a presentation of the SMP findings, distributing copies of the SMP summary and full document to planning officers and assisting planning officers in implementing the findings into local planning policy.		Jan-11		Apr-11		All	NNDC, GYBC, WDC, EA		H	H
Social Mitigation	**G/08**	**Units where there is a change of policy option.**	**Cell Wide**	Explore opportunities to jointly develop and deliver priority social mitigation measures.	Where views coincide (public, officer and member level) regarding priorities for social mitigation measures between Policy Units and across local authority boundaries, explore ways to apply them jointly. If necessary/appropriate, ensure that representations to other bodies or Central Government are coordinated.	G/03, G/04	Jan-11		Jan-12		EA	NNDC, GYBC, WDC		H	H
Social Mitigation	**G/09**	**Units where there is a change of policy option.**	**Cell Wide**	Develop and agree a standard approach to to exit strategies, which will include the implementation of agreed social mitigation measures.	As social mitigation measures are developed and funding secured, etc., preparations will need to be made to implement these measures and move towards the identified change of SMP policy. A common framework to assist in the preparation of Policy Unit-specific exit strategies would need to be developed well in advance such that it can be subject to consultation and agreement.	G/03, G/04	Jan-12		Jan-13		NNDC	EA, GYBC, WDC		H	L
Planning Policy	**G/10**	**All**	**Cell Wide**	Investigate possible planning responses to the SMP and explore opportunities to jointly develop and deliver planning policy responses for example promoting policy risk zones or the relocation of certain land uses.	Many of the SMP policy options in the Kelling to Lowestoft Ness SMP would benefit from consistent planning policies being agreed to support the SMP objectives (e.g. to prevent or manage new development in defined risk areas; to facilitate relocation of certain land uses and/or critical infrastructure where necessary; and to limit blight). Potential planning policies which should be investigated include policy risk zones or the relocation (or roll-back) of certain land-uses. Whereas care will be required in presentation, the objective would be to include such policies in development framework documents. Joint discussions should be held to identify the full range of such options and to ascertain the extent of common ground between local authorities. [N.B. When each LDF is reviewed this consistent approach to coastal planning should be embedded in the local planning framework]. The planning responses will continue to be based on the SMP policy until the next SMP review. Where views coincide regarding the planning response necessary to deliver the SMP policies, collaborate to develop consistent cell-wide development control guidance.	G/03, G/04, G/08, G/09	Jul-10		Jul-11		NNDC	EA, GYBC, WDC		H	H
Planning Policy	**G/11**	**6.06, 6.08, 6.10-6.16, 6.19, 6.20, 6.22**	**Cell Wide**	Develop consistent plans for the relocation of people and removal of assets when they become at immediate risk from erosion in line with Defra Coastal Change Policy and resulting pathfinder studies.	It is essential that the exit strategies developed under action G/5 are translated into planning policy, preferably in a consistent manner across all coastal authorities.	G/03, G/08, G/09, G/10, G/13, G/12	Jun-10		Ongoing		NNDC	EA, GYBC, WDC		H	M
Methods and tools	**G/12**	**6.6, 6.8, 6.10-6.16, 6.19, 6.20, 6.22**	**Cell Wide**	Develop consistent medium to long-term plans for relocation of services and facilities that will be lost to erosion, e.g. outfalls, highways in line with Defra Coastal Change Policy and resulting pathfinder studies.	Utilities companies and other infrastructure service providers, such as local highways authorities, will need to ensure that their forward plans take into account the findings of the SMP and any follow on studies.	G/03, G/08, G/09, G/10, G/13, G/11	2012		2013		Service and utilities providers	NNDC, GYBC, WDC, EA		M	L

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Data and Monitoring	**G/13**	**All**	**Cell Wide**	Develop and manage a joint coastal database, to include spatial and temporal quantitative and qualitative information.	Effective implementation of the SMP policies will in part depend on the adequacy of the data used to inform decision making. A central database should be developed to record information such as coastal erosion and flooding events; modelling outcomes; environmental surveys; social and other mitigation measures applied and the effects thereof; affected properties; consultation responses, etc. Spatial information should be digitised in a standard GIS format. NB. Such information will also be valuable in informing future SMP reviews. Data should also be formatted for inclusion on the National Flood and Coastal Defence Database (NFCDD).		Jun-10		Ongoing		EA	NNDC, GYBC, WDC		M	M
Social Mitigation	**G/14**	**All**	**Cell Wide**	Communicate the findings of all Coastal Change Pathfinder Studies to coastal authorities and coastal communities.	Many of the Coastal Pathfinder Studies rely on extensive participation of coastal communities in their development. However it is essential that the final outcomes of the studies are communicated to local communities and the coastal authorities.	G/03, G/04, G/08, G/09, G/10, G/06, G/15	May-11		Jun-12		NNDC	EA, GYBC, WDC		H	M
Social Mitigation	**G/15**	**All**	**Cell Wide**	Maintain communications with all coastal communities throughout the life of the plan	To ensure that all members of the public and other organisations are able to appreciate the current situation regarding SMP policy, recent changes on the coast, recent strategy findings, up to date news regarding Government policy etc it is proposed that an SMP Website be developed for Cell 6. All public documents relating to coastal work in cell 6 would be deposited on the site, and links provided to the LDF, Regional Development Plan, EA flood maps etc. This may help to address the concerns the public have with the quieter periods between studies. Access to this information could be provided in association with the action to develop a technical database for Cell 6.	G/14, WDC/01, G/13	Jun-10		Ongoing		EA	NNDC, GYBC, WDC		M	M
Methods and Tools	**G/16**	**All**	**Cell Wide**	Invite the authors/promoters/advisors of the MAREA project to a meeting for dicussions regarding the findings of their recent study.	Marine Aggregate Regional Environmental Assessments (MAREA) are voluntary studies being undertaken by the aggregate dredging industry. It is important that the findings of the MAREA covering this section of the coast are clearly understood and that the steering group are better equipped to respond to public concerns regarding the impact of dredging activity on coastal erosion and flood risk.		2011		Ongoing		AODA	GYBC, ABP, EA, NE, GYBC, WDC	N/a	M	M
Methods and Tools	**G/17**	**All**	**Cell Wide**	Ensure compliance with the Marine and Coastal Access Act 2009	There is a requirement for access to the coast to be maintained under the Marine and Coastal Access Act 2009. This will be co-ordinated by Natural England, working closely with Coastal Authorities. The requirement to provide access to the coast will need to be taken into account in all future SMP planning for the coast.		2010		2020		NE	SCC, GYBC, NE, EA, Community, business etc	N/a	H	H
Planning Policy	**G/18**	**All**	**Cell Wide**	Communicate the completion of the SMP to the Regional Assembly to ensure appropriate reflection of the policy aims in the Regional Plan.	Methods will need to be agreed for effective communication. These may include giving a presentation of the SMP findings, distributing copies of the SMP Summary document to the Regional Assembly office and offering to assist the RA with implementing the findings into the Regional Plan.	G/19	Jan-11		Apr-11		EA	NNDC, GYBC, WDC		L	L
Planning Policy	**G/19**	**All**	**National**	Promote a formal policy link between SMPs and Local Development Frameworks/Regional Plans, through updates to Planning Policy Statements.	Many of the actions in the SMP are designed to cascade down the findings of the SMP into local planning policy. This action aims to support this by pushing for changes at a national level to formally link SMPs to the LDF and regional policy via national Planning Policy Statements. This will require Defra and Communities and Local Government to review current arrangements.	G/01,G/18	Jun-10		Jun-11		EA/RCG (EACG)	NNDC, GYBC, WDC		M	L
Methods and Tools	**G20**	**All**	**Cell Wide**	Updating of the Action Plan	The Action Plan is a live document which will be reviewed and updated in all future sub group meetings.	All	Jan 11		Ongoing		NNDC	EA, GYBC, WDC		H	H

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Data and Monitoring	**NNDC/01**	**6.07**	**Trimingham**	Identify an economic baseline and options for the continued defence of Trimingham.	As and when defences fail, the cost of repairs or replacement will be identified and compared to the economic baseline developed under this action. It will also be necessary to identify options for the continued defence of Trimingham, to assess whether it is physically possible to continue its defence. This can be undertaken as part of the wider Cromer to Cart Gap Coastal Management Strategy (see NNDC/3).	NNDC/03			Incl in NNDC/3		NNDC			M	M
Studies	**NNDC/02**	**6.01**	**Bacton Gas Terminal**	Work with the owners of the Bacton Gas Terminal to better understand the life expectancy of the site, and the implications of this for the SMP as a whole.	The long term policy of Managed Realignment may not be viable if the life expectancy of the gas terminal is to be extended. In this case other options may need to be considered, such as hold the line with sediment bypassing. (See also NNDC/3)	NNDC/03				Incl in NNDC/3	NNDC			H	L
Strategies	**NNDC/03**	**6.05 to 6.13 (part)**	**Cromer to Cart Gap**	Combine and review strategies completed 2001 to 2005 to prepare Coastal Management Strategy.	The long term policies on this frontage contain a mix of Hold the Line, Managed Realignment and No Active Intervention. The study will need to explore the sustainability of this mix of policies over the frontage. It will also need to identify actions (other than coast defence) that are necessary to implement the policies.	Strategy covering this section of coast to commence in 2010/11	Nov-10		Nov-11	£320k	NNDC			H	H
Data and Monitoring	**NNDC/04**	**6.01 to 6.12**	**Kelling to Cart Gap**	Long term strategic monitoring in line with national programme.	Continued monitoring is essential to provide a robust baseline for consideration in the coastal strategies and next SMP review.		Ongoing		Ongoing	£20k per year	NNDC			M	M
Works	**NNDC/05**	**6.02**	**Sheringham**	Maintenance / refurbishment of existing sea wall with particular attention to toe protection. A project appraisal report will need to be developed in order to progress these works.	The existing defences have significant lengths without toe protection and are vulnerable to beach draw down. As the policy option is to hold the line the defences will need to be refurbished. A project appraisal report will need to be developed in order to progress these works.	Monitoring	Jan-10	Jan-10	?	£2.6m	NNDC			H	H
Works	**NNDC/06**	**6.03**	**Runtons**	Maintain accesses and local defences at Runton Gaps.	The accesses are important tourist facilities and therefore need to be maintained. A project appraisal report will need to be developed in order to progress the repairs.	Monitoring	Ongoing		?	£5,000 per year	NNDC			M	L
Strategies	**NNDC/07**	**6.04**	**Cromer**	Review of the Cromer Coastal Defence Strategy Study.	An update is required of the 2002 Cromer Coastal Strategy Study.	NNDC/8	Ongoing	Aug-09	Apr-10	£250k	NNDC		ET 4091	M	M
Studies	**NNDC/08**	**6.04**	**Cromer**	A project appraisal report will need to be developed in order to progress the refurbishment of defences.	Significant lengths of existing defences identified as close to failure and could fail under certain conditions. As the policy option is to hold the line the defences will need to be refurbished.	NNDC/7	Jan-11		Apr-11	£12m	NNDC		ET 4091/1a	H	H
Works	**NNDC/09**	**6.06 to 6.07**	**Overstrand to Mundesley**	Removal of groynes and revetment as they become a health and safety problem.	The main reason for removal of defunct defences is health and safety; however there are also benefits in terms of visual amenity and general amenity for users of the beach.	NNDC/3	As required		As required	£500 per metre	NNDC			M	L
Works	**NNDC/10**	**6.06 to 6.07**	**Overstrand to Mundesley**	Maintain defences in the absence of an adaptation strategy.	Managed realignment or NAI policies cannot be implemented without further studies and actions focussed on . Without them defences will continue to be maintained.	NNDC/3	As required		As required	£350k every 10 years starting in 2020	NNDC			L	L
Works	**NNDC/11**	**6.08**	**Mundesley**	Maintain / refurbish defences. A project appraisal report will need to be developed in order to progress the the works.	Defences will require works to ensure the planned 50 year life. A project appraisal report will need to be developed in order to progress the the works.	NNDC/3	2015		2055	£500k every 10 years starting in 2015, until 2055.	NNDC			M	L

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Works	**NNDC/12**	**6.09 to 6.12**	**Mundesley to Cart Gap**	Removal of groynes and revetment as they become a health and safety problem.	The main reason for removal of defunct defences is health and safety; however there are also benefits in terms of visual amenity and general amenity for users of the beach.	NNDC/3	As required		As required	£500 per metre	NNDC			M	L
Works	**NNDC/13**	**6.06 to 6.12**	**Mundesley to Cart Gap**	Maintain defences in the absence of an adaptation strategy.	Retreat or NAI policies cannot be implemented without further studies and actions. Without them defences will continue to be maintained. A project appraisal report will need to be developed in order to progress the the works.	NNDC/3	2010		Ongoing	£75k per year until 2015. £25,000 per year thereafter	NNDC			L	L
Works	**NNDC/14**	**6.12**	**Cart Gap**	Maintain defences. A project appraisal report will need to be developed in order to progress the works.	Maintain existing defences and ensure they are not outflanked	NNDC/3	Feb-10		Mar-10	£25k	NNDC			M	M
Planning Policy	**NNDC/15**	**6.01 to 6.13**	**Kelling to Horsey**	Include SMP policies in Local Searches	To ensure that prospective land or property purchasers are fully aware of the medium and/or long term proposals to move to NAI or MR.		Ongoing				NNDC			H	H
Data and Monitoring	**GYBC/01**	**6.14**	**Winterton Ness**	Continue to review rapid retreat rates at Winterton Ness to establish any need for a specific study. Monitor dune erosion to pro-actively implement exit plan if required.	There is a potential need to develop an exit plan for management of erosion, safe removal of properties and relocation of people, once appropriate social mitigation measures are in place	G/09	Jul-10		Ongoing		GYBC			H	M
Works	**GYBC/02**	**6.15**	**California to Caister**	Maintenance of existing rock bund, groynes and sea wall	The policy here is to hold the line in the short and medium term with a move to managed realignment in the long term once suitable social mitigation measures are in place. Until such time as these measures are in place it will be necessary to maintain the existing defences.		Ongoing				GYBC			M	M
Works	**GYBC/03**	**6.16**	**Caister-on-Sea**	Maintenance to (and if necessary replace) existing seawalls, reefs and groynes	The policy here is to hold the line in the short term with a move to managed realignment once suitable social mitigation measures are in place. Until such time as these measures are in place it will be necessary to maintain the existing defences.		Ongoing				GYBC			M	M
Studies	**GYBC/04**	**6.?? to 6.24**	**Great Yarmouth Outer Harbour**	Review monitoring of any changes resulting from the development of the Outer Harbour	There is a legal requirement for monitoring to be undertaken relating to the newly constructed Great Yarmouth Outer Harbour. The EACG will need to ensure that this monitoring is being undertaken and that the results are taken into account in future Strategies, SMP3, etc.	G/13	2007	TBC?	ongoing		GYBC	GYPA, ABP, EA, NE, GYBC, WDC	N/a	H	H
Social Mitigation	**WDC/01**	**6.20 to 6.22**	**Corton / Hopton**	Community engagement regarding adaptation.	Each coastal authority will need to engage with their local communities when considering appropriate social mitigation.	G/02, G/03, G/04, G/05, G/06, G/11	2009		2011	£300k	WDC	SCC, GYBC, NE, EA, Community, business etc		H	H
Strategies	**WDC/02**	**6.18 to 6.24**	**Gorleston to Lowestoft Ness**	Undertake Coastal Strategy Study	Includes review of policies at Corton and Hopton plus measures to Hold The Line at Norh Lowestoft and manage derelict defences elsewhere.	WDC/01	2010		2012	£250k	WDC	GYBC, NE, EA	WDC20	M	M
Works	**WDC/03**	**6.20 to 6.22**	**Corton to Hopton**	A project appraisal report will need to be developed in order to progress the management of defences.	A project appraisal report will need to be undertaken to consider the management of defences. Subject to findings of policy review within WDC/2 informed by output of WDC/1.	WDC/01,WDC/02	2012		2014	£180k	WDC	GYBC	WDC21	H	M
Works	**WDC/04**	**6.24**	**North Lowestoft**	Improve defences	A project appraisal report will need to be developed in order to progress the repair / removal of defences.	WDC/11, WDC/12	2012		2014	£180k	WDC	EA	WDC25	H	L

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Studies	**WDC /05**	**6.23**	**Gunton**	Management and monitoring of Eleni V oil burial sites.	A study will need to be undertaken to look at the options for managing the oil burial sites before they are affected by erosion. Solutions may include treatment in situ, however this would require a reasonable lead in time to develop the bacterial mixture for treatment. The study will include identification of monitoring requirements	WDC/02, WDC/06	2013		2015	£10k	WDC	NE, EA, SCC	N/a	H	L
Works	**WDC /06**	**6.23**	**Gunton**	Remediation or removal of Eleni V oil from foreshore burial sites.	Once an agreed solution has been identified, works will need to be undertaken to remove, or preferably remediate the oil burial sites. Timing of action will be linked to management policy for Corton frontage.	WDC/05	2016		2020		WDC	NE, EA, SCC, WDC	N/a	M	H
Studies	**WDC /07**	**6.21**	**Corton**	Monitoring and Management of RAF Hopton bunker.	A study will need to be undertaken to look at the options for managing the RAF Hopton bunker, as it becomes exposed by coastal erosion.	WDC/02	2013		2015	£10k	WDC	NE, EA, SCC, Landowner.	N/a	M	L
Works	**WDC /08**	**6.21**	**Corton**	Remove RAF Hopton bunker.	Once an agreed solution is identified, the bunker will need to be removed. Is linked to management policy for Hopton frontage.	WDC/07	2016		2020		WDC	NE, EA, SCC, Landowner.	N/a	H	L
Works	**WDC /09**	**6.21**	**Corton Hopton**	Manage defences	The main reason for removal of defunct defences is health and safety; however there are also benefits in terms of visual amenity and general amenity for users of the beach. Works specified by WDC/3. Note links to WDC/07 – there may be a justification for intervention to protect the bunker if removal is problematic, and a lack of protection would increase health and safety risks.	Corton /Hopton PAR WDC/03/07/08	2014		2016	£4m	WDC	GYBC	WDC 9 &12	L	H
Social Mitigation	**WDC /10**	**6.21 to 6.22**	**Corton.**	Adaptation mitigation works.	Social mitigation will be identified for Corton as part of the Pathfinder work. Works specified by WDC/1 subject to policy confirmation / amendment.		2010		2012	£800k	WDC	SCC, GYBC, NE, EA, Community, business etc	N/a	H	M
Works	**WDC /11**	**6.24**	**N Lowestoft**	Scour protection and structure improvements.Design and works. Phase 1	Works in response to increasing pressure on frontage.	WDC/04	2015		2017	£3.3m	WDC	EA	WDC 08	H	M
Works	**WDC /12**	**6.24**	**N Lowestoft**	Scour protection and structure improvements. Design and works. Phase 2	Works in response to increasing pressure on frontage.	WDC/04	2017		2019	£4.1m	WDC	EA	WDC 15 & 18	H	L
Data and Monitoring	**WDC /13**	**6.20 to 6.24**	**Waveney frontage.**	Develop an updated detailed monitoring plan.	Process underway in collaboration with EA.	EA Regional Monitoring Programme.	2009		2011	Costs met by EA. RMP	WDC	EA	N/a	M	M
Data and Monitoring	**WDC /14**	**6.20 to 6.24**	**Waveney frontage.**	Develop an improved asset inspection / reporting process.		NFCDD or successor – link with SMP 3C output.	2010		2010		WDC	EA	N/a	M	M
Works	**WDC /15**	**6.21**	**Rural Corton**	Moderate effort to manage defence failure/ ruins.	As defences fail it will be important to manage them in terms of health and safety and amenity. Defences will be removed or made safe.	WDC/02	Ongoing				WDC			M	L
Works	**WDC /16**	**6.22**	**Corton Village**	High and increasing effort to sustain defence and access to target residual life.	Asset maintenance activities as the short to medium term policy is to hold the line. May be extended if management approach is altered by strategy.	WDC/02	Ongoing				WDC			M	M

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Works	**WDC/17**	**6.23**	**Gunton**	Moderate effort to manage defence failure/ ruins.	As defences fail it will be important to manage them in terms of health and safety and amenity. Defences will be removed or made safe.	WDC/02	Ongoing				WDC			M	M
Works	**WDC/18**	**6.24**	**Lowestoft North Denes**	High effort to sustain ageing defence in increasingly exposed environment	Asset maintenance activities, as the policy is to hold the line.	WDC/02	Ongoing				WDC			H	M
Data and Monitoring	**HRA/01**	**6.08, 6.10, 6.11, 6.13, 6.15, 6.16, 6.17**	**Conditional policies units and hinterland including The Broads**	Undertake monitoring to provide a baseline for the assessment of the potential effects of the SMP policies, and natural changes, on sites of international importance for nature conservation	An initial study , followed by substantial baseline monitoring will be required. This will provide an adequate baseline against which to assess/model the potential changes that could occur as a result of the SMP policy options, as well as the background changes that are or will occur irrespective of the policy, such as sea level rise.	HRA/02, HRA/03, HRA/04	Jan-11		Ongoing		NNDC	NE, EA, Broads Authority		H	M
Studies	**HRA/02**	**6.08, 6.10, 6.11, 6.13, 6.15, 6.16, 6.17**	**Conditional policies units and hinterland including The Broads**	To model the likely habitat changes in The Broads as a result of the possibility that the policy could change to managed realignment in the long term, if holding the line is no longer sustainable.	A model, most likely a combination of a GIS based DTM and conceptual model, will need to be developed in order to understand what habitats may naturally form, in time, from the transition from HTL to MR or NAI policies. Data required will come from action NE/1 as well as DTM information from Lidar or Radar surveys.	HRA/01, HRA/03, HRA/04	Jan-11		Jan-13		NNDC	NE, EA, Broads Authority		M	M
Studies	**HRA/03**	**6.08, 6.10, 6.11, 6.13, 6.15, 6.16, 6.17**	**Conditional policies units and hinterland including The Broads**	Undertake assessment work to identify the options for habitat compensation for 6.13 and other conditional policies.	Further studies will be required in order to identify when, where, and how the natural processes and policy options identified in the SMP will affect internationally important habitats designated as SACs or SPAs. Once the potential impact is understood more clearly, the options for the creation of compensatory habitat can be identified. The results of action to model natural habitat changes will be a critical element. This information will be used in particular during the next review of the SMP as part of the Appropriate Assessment work.	HRA/01, HRA/02, HRA/04	Jan-11		Jan-13		NNDC	EA, NE Defra, Broads Authority		M	M
Studies	**HRA/04**	**6.08, 6.10, 6.11, 6.13, 6.15, 6.16, 6.17**	**Conditional policies units and hinterland including The Broads**	Liaison with JNCC, Defra and EC to define/agree what constitutes habitat compensation.	It is unlikely that there will be significant opportunities to re-create Broadland aquatic habitats as part of compensation for a transition in the long term or beyond to a policy of MR. If the MR is limited to an extent where the habitat can be compensated like-for-like then this will significantly reduce the scope for MR. However if habitat loss can be compensated for with the creation of new, but different habitat (saline lagoons, sand dunes, saltmarsh, fen, mud flat, reedbeds etc) then there will be much more scope for realignment.	HRA/01, HRA/02, HRA/03	Mar-10		Jan-13		NE	EA		M	L
Data and Monitoring	**EA/01**	**All**	**Anglia**	Regular Monitoring Programme.		G/13, WDC/13	2011		2016		EA	GYBC, NE, SCC, WDC, ABP etc.		M	M
Data and Monitoring	**EA/02**	**6.13**	**Eccles to Winterton**	Monitor beach recharge to ensure appropriately low level of shell fragments in recharge material.	In order to ensure that the recharge material that will eventually feed the dunes to the south is appropriate for the purpose. The Dunes are de-calcified, and it is important to ensure that material used for recharge has a low calcium content.									M	M
Data and Monitoring	**EA/03**	**6.13**	**Eccles to Winterton**	Annual beach and bathymetric monitoring			Ongoing			£70k pa	EA			M	M
Works	**EA/04**	**6.13**	**Eccles to Winterton**	Stage 3B Beach Recharge and Groyne Replacement		EA/02	2011		2012	£10.5m	EA			M	M
Works	**EA/05**	**6.13**	**Eccles to Winterton**	Sea Wall and Groyne Maintenance			Ongoing			£50k pa					

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Studies	**EA/06**	**6.13**	**Eccles to Winterton**	Beach Management Performance Review			2011		2012	£150k	EA			L	L
Studies	**EA/07**	**6.13**		Combined Study for policy unit 6.13	There would be merit in undertaking some work to bring together the current beach and bathymetric monitoring, proposed Beach Management Performance Review scheduled for 2011/12, and the proposed beach recharge and groyne replacement. It would be beneficial to undertake a coastal process/sediment transport review for 6.13, and covering the adjoining frontages. This study would need to take into consideration the findings of the Southern North Sea Sediment Transport Study undertaken around 2000/2002. This will provide an improved understanding of the processes and trends that are happening now to inform the next Strategy Review	EA/02, EA/03, EA/04, EA/05, EA/06	2012		2014		EA			M	L
Studies	**EH/01**	**All MR and NAI policy units**	**Wherever coastal eroision or flooding is predicted to occur**	To identify the cultural heritage assets at risk from erosion and/flooding and ensure that appropriate records are developed as to the historical, cultural and archaeological interest of features that will be lost.			2012		Ongoing as required		EH	EA, GYBC, WDC, NNDC, NCC, SCC		M	M
Data and Monitoring	**WFD/01**	**6.02; 6.04; 6.17; 6.18; 6.24**		Modelling/monitoring to improve understanding of the implications of long term hold the line policies for alongshore and offshore sediment transport	Where the Epoch 2 and 3 policy is to hold the line, these defended areas will increasingly function as a terminal groyne, interrupting and potentially preventing alongshore transport of sediment. Monitoring and modelling will be essential to improve understanding of the long term evolution of the coast, particularly immediately up-and down-drift of these frontages. If sediment will be lost offshore or otherwise no longer be available to replenish beaches downdrift, it may become necessary to explore mitigation options such as sediment bypassing or sediment recycling.		Modelling as required to inform SMP 3 review; monitoring in advance of policy change.							M	M
Studies	**WFD/02**	**6.04; 6.06; 6.08; 6.10; 6.11; 6.12; 6.15; 6.16; 6.18; 6.20; 6.22; 6.23.**		Investigations and monitoring to help prevent release of contaminants in to aquatic environment as a result of managed realignment and no active intervention policies	Where a policy of managed realignment or no active intervention will lead to erosion in areas of known or potential contamination, it is important to understand the potential risks. Investigations should therefore be undertaken to establish likely sources of contamination (including possible local hot spots in urban areas as well as dedicated industrial or waste facilities). A proportionate programme of monitoring should be commenced to identify any expose and erosion of such substances; and remediation or other mitigation measures should be implemented as necessary both to comply with Section 85 of the Water Resources Act 1991and to prevent deterioration in WFD chemical status. This is important because the WFD makes no provision for exemptions with regard to chemical status.		Investigations: as soon as appropriate. Monitoring: when policy change is implemented.							M	M

Type	Ref	Policy Unit	Location	Action	Description	Linked Action	Planned start	Actual start	Deadline	Cost	Lead	Partners	MTP ref	Priority H/M/L	Urgency H/M/L
Studies	**WFD/03**	**6.08; 6.13**		Investigations to improve understanding of the current use and expected life of existing SPZs identified as potentially at risk by SMP policies, and hence potential implications of SMP policies	Following the long term change from hold the line to managed realignment in policy unit 6.08 there is likely to be rapid erosion causing the coastline to retreat to within approximately 100 m of the mapped SPZ Zone 1 potable resource by the end of the third Epoch. This could potentially lead to saline intrusion in the ground water body. Information is therefore needed on the current use of this potable water source and hydro-geological investigations need to be carried out in consultation with the operators of the abstraction to inform SMP 3. Similar measures are needed with regard to two SPZ Zone 1s near Ingham and Catfield where the conditional long-term policy could result in saline inundation leading to the contamination or loss of these water resources.		In advance of policy change							M	M
Studies	**WFD/04**	**6.08**		Research into potential implications of SMP managed realignment policy in unit 6.08 for the River Mun WFD water body	Research and investigation will be required to develop an adequate understanding of the likely evolution of the coastline; the implications of the SMP third epoch managed realignment policy in the vicinity of the outfall of the River Mun; and hence the effects on relevant biological, hydromorphological and physico-chemical parameters.									M	M
Studies	**WFD/05**	**6.11; 6.13**		Research into potential implications of SMP managed realignment policies in units 6.11 and possibly 6.13 for various freshwater bodies and Protected Areas.	In line with both the outcomes of the Habitats Regulations Assessment and the WFD Programme of Measures, appropriate monitoring, investigations and research, and (if appropriate) mitigation measures will be required to help understand and deal with the potential consequences of the long term managed realignment policies in unit 6.11 and possibly 6.13. This monitoring and associated follow up action will need to consider the possible effects (from an increased marine influence through to a WFD water body type change) for East Ruston Stream, New Cut, River Thurne, Hickling Broad, Horsey Mere, Martham Broad and the associated Broads Protected Areas.									M	M
Data and Monitoring	**WFD/06**	**All policy units**		Monitoring to support climate change adaptation needs	SMP policies must anticipate the issues likely to arise as a result of climate change and make necessary provision for adaptation (i.e. taking measures aimed at reducing vulnerability and increasing resilience). Monitoring and modelling will therefore be essential to ensure that future shoreline management decisions do not compromise the achievement of WFD objectives									M	M

6.5 MANAGEMENT OF SMP UNTIL NEXT REVIEW

Through the implementation of actions outlined in sections 6.2 to 6.4, the technical understanding of this coastline, the basis of some SMP policy options and the wider shoreline management framework could change. As such, it is important that progress against these actions is monitored by the Coastal Group so that any developments which might affect policy, and hence works, are notified, and also so that any need for revision of the SMP can be monitored.

Tables 6.1 to 6.3 above effectively provide a checklist against which progress can be monitored. It will be the responsibility of the Coastal Group to promote and monitor progress, with the Action Plan retained on the agenda for all future Coastal Group meetings.

The Kelling to Lowestoft Ness SMP website (part of the EACG website) will have an 'updates' page on which this Action Plan will be placed and progress against the actions reported. This will include identification of the implications of any study outputs or wider developments for the relevant SMP policy options. The 'updates' are important as the means of disseminating progress to stakeholders and, as such, the existence of this page will be reported during the final SMP dissemination process. The responsibility for maintaining the 'updates' page will remain with the Coastal Group.

It is not possible at this time to set a date for the next review of the SMP. It is considered likely that a 5 to 10 year period may be appropriate, however it is vital that changes in understanding or the shoreline management framework are monitored to establish if there comes a point (within the next 5 to 10 years) that the SMP policy options become sufficiently out of date as to warrant a full review of the Plan. This will be a judgment made by the Coastal Group as it is not possible to prescribe exactly at what point this could be.

Regardless of other developments, it is considered that a review should be undertaken in 10 years (if not before) in order to ensure the policy options and longer term Plan remain appropriate.