

Isle of Grain to South Foreland Shoreline Management Plan (SMP) Review

Appendix J – Habitats Regulations Assessment

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Approved by
1	0	Initial Draft	08.01.09	T. Edwards
	1	Amendments following consultation	11.03.08	T. Edwards

Appendix J: Habitats Regulations Assessment

<i>Contents</i>	<i>i</i>
<i>List of Appendices</i>	<i>iv</i>
<i>List of Tables</i>	<i>v</i>
<i>List of Figures</i>	<i>vi</i>
<i>The Supporting Appendices</i>	<i>vi</i>
<i>Executive Summary</i>	<i>vii</i>
J1 INTRODUCTION AND REQUIREMENT FOR HABITATS REGULATIONS ASSESSMENT	1
J1.1 Introduction	1
J1.2 Role of Organisations in Appropriate Assessment	2
J1.2.1 Competent Authorities	2
J1.2.2 Natural England	2
J1.2.3 Secretary of State	3
J1.3 Structure of this report	3
J1.4 Method of Assessment	4
J1.5 SMP Roles and Stage 1 Assessment	6
J1.6 Background to the European Sites	7
J2 STAGE 2: ASSESSMENT OF LIKELY SIGNIFICANT EFFECT	10
J2.1 Generic Effects Controllable by Conditions – Applicable to all assessments	10
J2.2 Sequential Test of Policies	10
J2.3 Thames Estuary & Marshes SPA/ Ramsar	10
J2.4 The Swale SPA / Ramsar	10
J2.5 Thanet Coast & Sandwich Bay SPA / Ramsar	11
J2.6 Thanet Coast SAC	11
J2.7 Sandwich Bay SAC	11
J2.8 Dover to Kingsdown Cliffs SAC	11
J3 STAGE 3: APPROPRIATE ASSESSMENT	12
J3.1 Introduction	12
J3.2 Method	12

J3.3	Thames Estuary & Marshes SPA & Ramsar Site	12
J3.3.1	Policy Unit 4a01: Managed Realignment (Epochs 1, 2 & 3)	13
J3.3.2	Conclusion	14
J3.4	The Swale SPA & Ramsar	14
J3.4.1	Policy Unit 4a06: Managed Realignment (Epochs 1, 2, & 3)	16
J3.4.2	Policy Unit 4a07a: Hold the Line (Epoch 1); Managed Realignment (Epochs 2 & 3)	16
J3.4.3	Policy Unit 4a07b: Hold the Line (Epochs 1 & 2); Managed Realignment (Epoch 3)	16
J3.4.4	Conclusion	17
J3.5	Thanet Coast & Sandwich Bay SPA & Ramsar	17
J3.5.1	Revised figures following Natural England advice	18
J3.5.2	Policy Unit 4a14: Hold the Line (Epoch 1); Managed Realignment (Epochs 2 & 3)	19
J3.5.3	Policy Unit 4a15, 4a16, 4a17, 4a18, 4a19 & 4a20: Hold the Line, or No Active Intervention where no defences in place	19
J3.5.4	Conclusion	21
J3.6	Thanet Coast SAC	21
J3.6.1	Revised figures following Natural England advice	23
J3.6.2	Policy Unit 4a14: Hold the Line (Epoch 1); Managed Realignment (Epochs 2 & 3)	23
J3.6.3	Policy Unit 4a15, 4a16, 4a17, 4a18, 4a19 & 4a20: Hold the Line, or No Active Intervention where no defences in place	23
J3.6.4	Conclusion	24
J3.7	In Combination Assessment	25
J3.7.1	Medway Estuary and Swale SMP2	25
J3.7.2	Thames Estuary 2100	25
J3.7.3	South East Plan, Thames Gateway Proposals & Local Development Frameworks	26
J3.7.4	Greater Thames CHaMP	26
J3.7.5	Faversham Creek to Whitstable Harbour Coastal Defence Strategy Plan; Pegwell Bay to Kingsdown Cliffs Coastal Strategy Plan	26
J3.8	Cumulative In Combination Effect Across the Natura 2000 Network	27
J3.9	Final Habitats Regulations Assessment	28
J3.9.1	Thames Estuary & Marshes SPA / Ramsar	28
J3.9.2	The Swale SPA / Ramsar	28
J3.9.3	Thanet Coast & Sandwich Bay SPA / Ramsar	29
J3.9.4	Thanet Coast SAC	29
J3.9.5	Sandwich Bay SAC	30
J3.9.6	Dover to Kingsdown Cliffs SAC	30

J4	STAGE 4: APPROVAL OR REFUSAL OF PLAN	31
J4.1	Alternatives	31
J4.1.1	Grazing Marsh	31
J4.1.1.1	Alternatives – No Active Intervention	31
J4.1.1.2	Alternatives – Advance The Line	32
J4.1.1.3	Alternatives – Hold The Line	32
J4.1.1.4	Alternatives – Managed Realignment with a Controlled Extent (to minimise ecological impact)	32
J4.1.1.5	Alternatives – Different Managed Realignment Timescale	33
J4.1.1.6	Alternatives – Additional Realignment Policies outside Natura 2000 sites	33
J4.1.2	Natural England advice on Least Damaging Alternative	34
J4.1.2.1	Hold the Line	34
J4.1.2.2	Managed Realignment with a Controlled Extent	34
J4.1.2.3	Timing and coastal squeeze compensation outside designated areas	34
J4.2	Imperative Reasons of Overriding Public Interest (IROPI) & Compensation	35
J4.2.1	IROPI (Managed Realignment with a Controlled Extent: Adverse Effect Justification)	35
J4.2.2	Compensation	36
J5	CONDITIONS, LIMITATIONS & FUTURE WORK	38
J5.1	Conditions	38
J5.1.1	General Obligations to avoid deterioration of European sites	38
J5.2	Limitations	39
J5.2.1	Intertidal Habitat Change Predictions	39
J5.2.2	Securing Compensation via Regional Habitat Creation Programme	39
J5.2.3	Status of Adjacent In Combination Studies	39
J5.3	Future Works	39
J5.4	Chalk reef methodology	40

List of Appendices

APPENDIX A: HABITATS REGULATIONS ASSESSMENT METHOD

APPENDIX B: MAPS OF INTERTIDAL HABITAT/ EPOCH/ SITE

APPENDIX C: MAPS OF FRESHWATER HABITAT/ EPOCH/ SITE

APPENDIX D: HR01 FORMS (APPENDIX 11) ENVIRONMENT AGENCY RECORD OF
ASSESSMENT OF LIKELY SIGNIFICANT EFFECT ON A EUROPEAN SITE

APPENDIX E: HR02 FORMS (APPENDIX 12) PROFORMA FOR STAGE 3 APPROPRIATE
ASSESSMENT

APPENDIX F: STAGE 4 (APPENDIX 20) PROFORMA FOR SECRETARY OF STATE
CONSIDERATION

APPENDIX G: MAP OF EUROPEAN SITES AND CITATIONS

APPENDIX H: MAPS OF POLICY UNITS

APPENDIX I: ISLE OF GRAIN TO SOUTH FORELAND SMP – GEOMORPHOLOGICAL ADVICE (LEE, 2009)

APPENDIX J: DEFRA APPROVAL LETTER

List of Tables

Table 1	Stages of Habitats Regulations Assessment	2
Table 2	Isle of Grain to South Foreland SMP Habitats Regulations Assessment Method	5
Table 3	European Site Interest Features	8
Table 4	Predicted habitat change in the Thames Estuary SPA / Ramsar at 4a01 resulting from Draft SMP policies	13
Table 5	Predicted habitat change in the Swale SPA / Ramsar at 4a06, 4a07a, 4a07b resulting from Draft SMP policies	15
Table 6	Predicted habitat change in the Thanet Coast & Sandwich Bay SPA / Ramsar at 4a14 resulting from Draft SMP policies	18
Table 7	Predicted erosion rates for chalk cliffs in the Thanet Coast & Sandwich Bay SPA / Ramsar resulting from Draft SMP policies	18
Table 8	Revised habitat change in the Thanet Coast & Sandwich Bay SPA / Ramsar resulting from Draft SMP policies	19
Table 9	Predicted habitat change in the Thanet Coast SAC resulting from Draft SMP policies	22
Table 10	Predicted erosion rates for chalk cliffs in the Thanet Coast SAC at 4a14 resulting from Draft SMP policies	22
Table 11	Revised habitat change in the Thanet Coast SAC resulting from Draft SMP policies	23
Table 12	Isle of Grain to South Foreland SMP Habitat Balance Sheet	36
Table 13	Proposed freshwater compensation sites for Habitat Creation Programme	37
Table 14	HRA Actions within SMP Action Plan	41

List of Figures

Figure 3.1	Thanet Coast chalk reef	20
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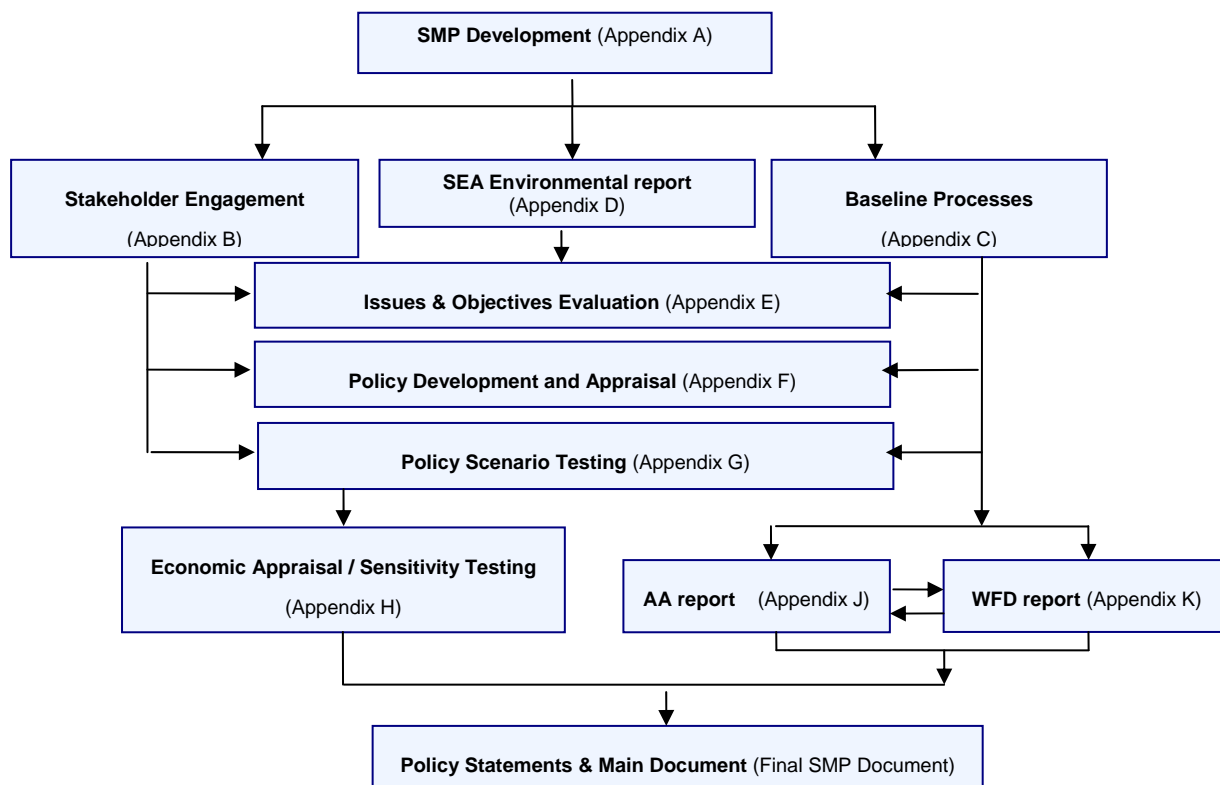
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The Supporting Appendices

This appendix and the accompanying documents provide all of the information required to support the Shoreline Management Plan. This is to ensure that there is clarity in the decision-making process and that the rationale behind the policies being promoted is both transparent and auditable. The appendices are:

A: SMP Development	This reports the history of development of the SMP, describing more fully the plan and policy decision-making process.
B: Stakeholder Engagement	All communications from the stakeholder process are provided here, together with information arising from the consultation process.
C: Baseline Process Understanding	Includes baseline process report, defence assessment, NAI and WPM assessments and summarises data used in assessments.
D: SEA Environmental Report (Theme Review)	This report identifies and evaluates the environmental features (natural environment, landscape character, historic environment, land use, infrastructure and material assets, and population and human health).
E: Issues & Objective Evaluation	Provides information on the issues and objectives identified as part of the Plan development, including appraisal of their importance.
F: Initial Policy Appraisal & Scenario Development	Presents the consideration of generic policy options for each frontage, identifying possible acceptable policies, and their combination into 'scenarios' for testing.
G: Scenario Testing	Presents the policy assessment and appraisal of objective achievement towards definition of the Preferred Plan (as presented in the Shoreline Management Plan document).
H: Economic Appraisal and Sensitivity Testing	Presents the economic analysis undertaken in support of the Preferred Plan.
I: Metadatabase and Bibliographic database	All supporting information used to develop the SMP is referenced for future examination and retrieval.
J: Appropriate Assessment	Presents an assessment of the effect the plan will have on European sites.
K: Retrospective WFD Assessment	Presents a retrospective Water Framework Directive Assessment.

Within each appendix cross-referencing highlights the documents where related appraisals are presented. The broad relationships between the appendices are as below:



Executive Summary

The Isle of Grain to South Foreland Shoreline Management Plan (SMP) has a potential effect on the following designated European Habitats Directive Sites and Ramsar sites (“European Sites”) in the local area:

- Thames Estuary & Marshes Ramsar / Special Protection Area (SPA)
- The Swale Ramsar / SPA
- Thanet Coast & Sandwich Bay Ramsar / SPA
- Thanet Coast Special Area of Conservation (SAC)
- Sandwich Bay (SAC)
- Dover to Kingsdown Cliffs (SAC)

An SMP is a non-statutory policy document for coastal flood and erosion risk management planning. Its main objective is to identify sustainable long-term management policies for the coast. The plan enables social, environmental and economic assets affected by coastal flood and erosion to be managed in the best way over the long term.

The SMP has been produced in partnership by Canterbury City Council (Lead Authority) and Halcrow Group (Ltd), according to latest government guidance (DEFRA, 2006). The shoreline management policies considered are those defined in this guidance: Hold the [defence] Line, Advance the Line, Managed Realignment and No Active Intervention.

SMPs are high level, strategic plans. The policies they set are further developed and appraised prior to implementation of any new flood defence and coastal erosion works – this can be through undertaking flood and coastal erosion risk management strategies, informed by technical and environmental studies.

The application of the Environment Agency Internal Guidance on Habitats Regulations Assessment has four stages;

1. Stage 1 – Scoping,
2. Stage 2 – Assessment of Likely Significant Effect,
3. Stage 3 – Habitats Regulations Assessment, and
4. Stage 4 – Consent or Refusal of the Application (including consideration of alternatives and Imperative Reasons of Overriding Public Interest). #

Stage 1 - Scoping

Canterbury City Council and Halcrow Group (Ltd) have developed the SMP, in consultation with Maritime Councils, the Environment Agency, Kent County Council, English Heritage and Natural England. Canterbury City Council has acted as lead authority for developing this SMP, and thus acts as lead competent authority for the Habitats Regulations Assessment.

Natural England and Canterbury City Council agreed to work in partnership in delivering the Habitats Regulations Assessment and agreed the scope of the assessment.

Stage 2 – Assessment of Likely Significant Effect

Stage 2 identified that the SMP would have a likely significant effect on the Ramsar sites / SPAs and SACs due to freshwater habitat displacement and intertidal habitat growth through Managed Realignment and Hold the Line Policies. Based on the 2002 North Kent Coastal Habitat Management Plan (CHaMP) for the area, coastal squeeze was not considered a likely significant effect at the time of the Stage 2 work.

Stage 2 identified that there would be No Likely Significant Effect on Sandwich Bay and Dover to Kingsdown Cliffs SACs.

Stage 3 – Habitats Regulations Assessment

It is important to note that the SMP sets policies for the shoreline not the location or scale of the effect of the policy. Whereas it is straightforward to assess the scale of impact for Hold the Line or No Active Intervention Policies, it is not straightforward for Managed Realignment policies e.g. this could mean a change in defence alignment by as little as 5 metres or as much as 500 metres. The actual extent of impact is determined at subsequent stages of work (flood risk management strategies and schemes) that flow from the SMP. These strategies and schemes will be subject to further Habitats Regulations Assessments as required.

To provide a reference point on which to base the Stage 3 assessment, and to provide other project benefits, *Indicative Realignment Extents* (“*Indicative Extents*”) were derived for Managed Realignment policies. These alignments were derived from the best available information on coastal processes, coastal defence type and cost, and consultation with local coastal managers. These alignments were indicative to provide a sense of scale for public consultation activities and for this Habitats Regulations Assessment, the actual scale of change would be the subject of greater study (to inform the subsequent strategies and schemes). The SMP recognises the information required for the greater studies and monitoring. These are detailed in Section 5 of this Assessment and within the SMP Action Plan.

The Habitats Regulations Assessment on the Preferred Policies and any associated *Indicative Extents* has concluded the following:

Site Specific

Thames Estuary & Marshes SPA / Ramsar:

Alone, the creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network. However, on the assessed extent of managed realignment, and based on the information available, **it is not possible to demonstrate that the SMP does not have an Adverse effect** due to the displacement of freshwater habitats.

In Combination, the Hold the Line policies in the adjacent Medway Estuary SMP2 have an **Adverse effect** through coastal squeeze of intertidal habitat. The Thames Estuary 2100 project, Thames Gateway project, the South East Plan and the Local Development Framework are recommending increased commercial development in the coastal plain protected by the defences.

The Swale SPA / Ramsar:

Alone, the creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network. However, on the assessed extent of managed realignment, and based on the information available, **it is not possible to demonstrate that the SMP does not have Adverse effect** due to the displacement of freshwater habitats.

In Combination, the Managed Realignment Policies from the Medway Estuary SMP2, the recommendations of local strategic plans (TE2100, Thames Gateway project, South East Plan, Local Development Frameworks) have a **Beneficial effect** on the Intertidal Habitats and an **Adverse effect** through displacement of Grazing Marsh and Standing Water habitat.

Thanet Coast & Sandwich Bay SPA / Ramsar:

Alone, the creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network. Based on the assessed extent of Hold the Line and available information, the prevented gain of potential chalk reef cannot be controlled by conditions. As the actual and prevented gain of chalk reef is outside the SPA & Ramsar site, and therefore has no actual or potential effect on the existing designated chalk reef habitat, it is concluded that these policies have **No Adverse Effect** on site integrity.

In Combination, the Medway Estuary SMP2 and Pegwell Bay to Kingsdown Cliffs Coastal Strategy are recommending changes to the adjacent coastline, the latter of which agrees with the policies in the Isle of Grain to South Foreland SMP.

Thanet Coast SAC:

Alone, the creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network. Based on the assessed extent of Hold the Line and available information, the prevented gain of potential chalk reef cannot be controlled by conditions. As the actual and prevented gain of chalk reef is outside the SAC, and therefore has no actual or potential effect on the existing designated chalk reef habitat, it is concluded that these policies have **No Adverse Effect** on site integrity.

In Combination, the Medway Estuary SMP2 and Pegwell Bay to Kingsdown Cliffs Coastal Strategy are recommending changes to the adjacent coastline, the latter of which agrees with the policies in the Isle of Grain to South Foreland SMP.

Habitats Regulations Assessment Conclusion (*Indicative Extents*)

The Habitats Regulations Assessment concludes that, Alone and In Combination, it is not possible to demonstrate that Managed Realignment policies would not have an **Adverse effect** on the integrity of the Thames Estuary and Marshes and The Swale SPA / Ramsar sites through displacement of Grazing Marsh and Standing Water habitats.

This assessment therefore progressed to Stage 4.

Stage 4 Alternatives, Imperative Reasons for Overriding Public Interest (IROPI) and Compensation**Alternatives**

The competent authority identified the following less damaging alternatives:

- a) Hold the Line, or
- b) Managed Realignment with a Controlled Extent (to minimise ecological impact)

Natural England were invited to formally advise on the least damaging of these alternatives and requested that the most timescales of the policies be considered. The advice from Natural England was as follows:

Hold the Line

Based on the best available information recently produced under the Greater Thames Coastal Habitat Management Plan (CHaMP) project, Hold the Line is now considered a damaging policy within all epochs due to its predicted loss of intertidal habitat through coastal squeeze. Natural England does not consider Hold the Line to be the least damaging alternative for any epoch of the plan based on this information.

Managed Realignment With a Controlled Extent

Following a review of the SMP policies within and outside the designated areas plus their respective timing, Managed Realignment with a Controlled Extent (to minimise ecological impact) **is the least damaging alternative** for all Managed Realignment Policies affecting the designated sites.

Timing and Coastal Squeeze Compensation Outside Designated Areas

With respect to timing and coastal habitat gains outside designated areas, the scales of coastal squeeze losses predicted by the Greater Thames CHaMP within the first epoch are greater than the potential Coastal Habitat gains in suitable undesignated areas within the whole SMP area. As such, both the Competent Authority and Natural England agree that the least damaging alternative will have to change the current composition of the Natura sites affected by the SMP. In turn, both parties agree that the SMP is likely to have an adverse effect in the first and latter epochs of the plan.

IROPI (Managed Realignment with a Controlled Extent: Adverse Effect Justification)

The least damaging alternative for implementing this plan is likely to cause adverse effect either through freshwater habitat displacement or coastal squeeze. As such, the competent authority need to consider whether the plan is necessary and needs to be implemented for 'IROPI.'

The aim of a Shoreline Management Plan is to 'identify the best approach or approaches to managing risks over the next 100 years from flooding and coastal erosion (including cliff instability) both for individual areas and the wider coast.'

In the absence of this plan, these issues would be managed in a less coordinated way that would increase the risk of:

- a. Less sustainable long-term action to manage coastal erosion and flooding in the face of climate change.
- b. Increased risk of flooding and erosion to assets (nationally, regionally and locally important) that would have significant socio-economic impacts
- c. Mismanagement of the coastal environment (including coastal squeeze problems)

The Greater Thames CHaMP has forecast major coastal squeeze problems if these estuaries continue to be managed as they currently are and change in management practices is necessary. The least damaging SMP policies identify the best way of changing management practices over the next 100 years in the least damaging way.

For these reasons the lead authority considers that the Shoreline Management Plan is necessary and has the following 'Imperative Reasons of Overriding Public Importance:'

- A need to address a serious risk to human health and public safety (uncoordinated and uncontrolled flood and erosion risks to large residential populations and major infrastructure);
- Where failure to proceed would have unacceptable social and/or economic consequences (loss of economic infrastructure, commercial property and community areas) through coastal flood and erosion damage;
- Whilst this is a damaging plan, it is the least damaging option for the designated sites in adjusting to the climate change impacts of sea level rise. This SMP therefore has beneficial consequences of primary importance for the environment.

Compensation

Compensation provisions were developed in partnership with Natural England using the best available information. The partnership agreed that, at SMP level, it was appropriate to

- follow DEFRA Policy Guidance on Coastal Squeeze and consider compensatory habitat 'secured' if it is suitably programmed and resourced within the Regional Habitat Creation Programme, and
- use the Greater Thames CHaMP predictions of coastal squeeze loss to develop precautionary compensation quotas.
- prioritise an action within the SMP Action Plan to investigate appropriate methods of compensating the loss of chalk reef.

Table 9 below summarises the management of coastal squeeze and freshwater habitat compensation within the SMP and the Regional Habitat Creation Programme (RHCP).

Isle of Grain to South Foreland SMP Habitat Balance Sheet

Epoch (yrs)	Greater Thames CHaMP Intertidal Losses in SMP Area (Ha)	SMP Intertidal Gains (MR) in Undesignated areas (Ha)	SMP Intertidal Gains (MR) in Designated areas (Ha)	SMP Designated Freshwater Displacement (Ha)	RHCP Intertidal Habitat Compensation for SMP (Ha)	RHCP Freshwater Habitat Compensation for SMP (Ha)
0-20	75	243	123	115	0	115
20-50	330	662	292	408	0	408
50-100	1130	14	295	679	0	679
TOTAL	<u>1535</u>	<u>919</u>	<u>710</u>	<u>679</u>	<u>0</u>	<u>679</u>

In interpreting the table, the following notes should be considered:

1. The table presents the additional change in habitat in each epoch, cumulative values are only presented in the total.
2. The table presents a range of values as we currently do not know the suitability of the undesignated areas of managed realignment as coastal squeeze intertidal habitat compensation. This may reduce the need for compensation within designated sites and corresponding freshwater habitat displacement.
3. The Greater Thames CHaMP has low confidence in the timing and scale of later coastal squeeze predictions. The SMP recommends a scale of realignment that best benefits estuarine and coastal processes. This is slightly more than the CHaMP prediction. The Medway and Swale Estuary SMP highlighted the possible need for an additional 600Ha of intertidal habitat to compensate for CHaMP predictions. Therefore, in combination with that SMP, the additional intertidal habitat creation opportunities within this SMP could contribute to the additional intertidal requirements needed for the Estuary SMP.

There are areas of undesignated grazing marsh adjacent and inland of the designated sites habitat, which, if managed properly, could compensate for the Adverse Effect on Freshwater Habitats arising from this SMP. These areas are summarised in Table 10.

Proposed Freshwater Compensation Sites for Habitat Creation Programme

Location	Habitat	Cumulative Habitat Area (Ha)
Rank 1 – South Swale	Grazing Marsh & Standing Water	665
Rank 2 – Possible additional sites within the Thames Estuary to be identified by the TE2100 programme		tbc

Should sufficient areas not be available within these sites, the RHCP will secure investigate locations increasingly further afield until suitable sites are found.

General Obligations to avoid deterioration of European sites.

The official position on the policies affecting the Thanet Coast & Sandwich Bay SPA/Ramsar site & Thanet Coast SAC is as follows;

As shown through the appropriate assessment, the extent of intertidal chalk reef will deteriorate over the duration of the SMP. Although this deterioration is outside of the remit of the SMP, there is an obligation on all Member States to take appropriate steps to avoid, in European sites, the deterioration of natural habitats for which the areas have been designated. This applies in so far as such

deterioration could be significant in relation to the objectives of the Directive to ensure 'favourable conservation status' of habitats and species. If influences acting on the site, result in making the conservation status of the habitat less favourable than it was before, then deterioration can be considered to have occurred, contrary to the Directive and its general aims.

Conservation status of a natural habitat is considered favourable on the basis that 1) the natural range and area it covers, is stable or increasing, 2) the specific structure and functions that are necessary for its long term maintenance exist, and are likely to continue to exist in the foreseeable future and 3) the conservation status of its typical species is favourable.

All measures taken pursuant to the Directive should be designed to ensure favourable conservation status of natural habitats and species.

J1 Introduction and Requirement for Habitats Regulations Assessment

J1.1 INTRODUCTION

The Shoreline Management Plan includes or has the potential to affect several European sites (Special Protection Areas, Ramsar sites and Special Areas of Conservation). Consequently, the requirements of the European Union Habitats Directive (92/43/EEC) and European Union Birds Directive (79/409/EEC), as implemented in the UK by the Conservation (Natural Habitats &c) Regulations 1994 ("Habitats Regulations") (and the Wildlife and Countryside Act 1981), have to be addressed. The implications of the plan on these European sites and the interaction with the requirements of the Habitats Regulations are critical to the development of a realistic and legally viable strategy.

Planning Policy Statement (PPS) 9 'Biodiversity and Geological Conservation' (published August 2005) sets out planning policies on protection of biodiversity and geological conservation through the planning system. This replaces Planning Policy Guidance Note 9 on nature conservation (PPG9) published in October 1994. The Habitats Regulations do not provide statutory protection for potential Special Protection Areas (pSPAs) or to candidate Special Areas of Conservation (cSACs) before they have been agreed with the European Commission. It is the policy of the UK Government to offer to consider pSPAs and cSACs and sites designated under the Ramsar Convention 1974 in line with the Habitats Regulations.

Regulation 48 of the Habitats Regulations requires that a plan or project likely to have a significant effect on a European site be subject to Habitats Regulations Assessment by a Competent Authority. In advance of planned amendments to the Regulations, DEFRA and the Environment Agency have agreed that CFMPs (Coastal Flood Management Plans), SMPs (Shoreline Management Plans) and flood risk management strategies constitute land use plans, as per the Directive.

For an SMP, the objective of Habitats Regulations Assessment is to determine the impact of all policy options proposed by the plan where there is a likelihood of an adverse effect on the integrity of a European site, either alone or in combination with other plans, programmes and projects.

It is standard practice for there to be four stages to an Habitats Regulations Assessment, as shown in Table 1.

Table 1 – Stages of Habitats Regulations Assessment

Stage	Task
1	Determine whether the plan is necessary for the site Assess & agree the appropriate level of assessment and information required with relevant conservation body
2	Assess Likely Significant Effect of the plan on each European Site
3	Assess whether the plan has an 'Adverse Effect' in reference to the site's conservation objectives (i.e. the reasons for which it was designated) Assess the in combination effects Determine 'No Adverse' or 'Adverse' Effect Assess alternative policies where 'Adverse' effect derived
4	Determine Overriding Public Interest where there are no viable alternatives Quantify and secure compensation Submit assessment to Secretary of State (DEFRA)

If Stage 4 is reached, the plan can only be implemented if the Secretary of State is satisfied that there are no available alternative solutions, that there are imperative reasons of over-riding public interest (IROPI) and that compensatory measures (e.g. compensatory habitat creation) are secured.

J1.2 ROLE OF ORGANISATIONS IN HABITATS REGULATIONS ASSESSMENT

J1.2.1 Competent Authorities

Competent authorities are responsible for:

- Making an Habitats Regulations Assessment before deciding to undertake, or give any consent, permission or other authorisation for a plan or project likely to have a significant effect on a European site, either alone or in combination with other plans and projects;
- For the purposes of the assessment, consulting the appropriate nature conservation body and having regard to its representations; and
- Ensuring that if there is a negative assessment of a plan or project, agreement to that plan or programme is only given if there are no alternative solutions, it must be carried out for imperative reasons of overriding public interest, and any compensatory measures that may be required are secured.

J1.2.2 Natural England

In England, the 'appropriate nature conservation body' under the Regulations (see 1.3.1) is Natural England. Natural England implement, on behalf of the Government, international conventions and EC Directives on nature conservation including the Conservation (Natural Habitats etc.) Regulations 1994, as follows:

- Provide advice on whether plans and programme are likely to have a significant effect [either alone or in combination with other plans and projects] when requested to do so;
- Advise competent authorities whether a plan or programme is necessary for the management of the site; Comment on Habitats Regulations Assessments;
- Provide advice on the ecological requirements of any compensatory measures; and
- Provide advice on the suitability of any proposed compensatory measures.

J1.2.3 Secretary of State

The Secretary of State is responsible for:

- Securing any necessary compensatory measures to ensure that the overall coherence of Natura 2000 Network is protected;
- Confirming that any compensatory measures are sufficient to maintain the coherence of Natura 2000 Network;
- Informing the Commission of the measures adopted; and,
- Directing the plan-making authority not to give effect to a plan that may have an adverse affect on site integrity.

J1.3 STRUCTURE OF THIS REPORT

This report is structured to follow the 4-stage assessment process outline in 1.1 as follows:

Section 1 – Introduction, Roles and Method Stage 1: Assessment of plan necessity and acceptable information base

Section 2 – Stage 2: Assess Likely Significant Effect

Section 3 – Stage 3: Assessment of Adverse Effect

Section 4 – Stage 4: Justification of Adverse Effect and Compensation

Section 5 – Limitations & Future Works

At the time of drafting, there is no formal guidance for the assessment of Shoreline Management Plans. This report documents the ‘Habitats Regulations Assessment’ process and has been produced following the best available advice and guidance.

As part of the Environment Agency’s internal Habitats Directive Guidance a HR01 (Appendix 11) form has been completed. This form is a record of Stage 2 (assessment of likely significant effect on a European site) and is contained in Appendix D. An HR02 (Appendix 12) form has also been completed; this form records Stage 3 (assessment of adverse effect on site integrity) and is contained in Appendix E.

J1.4 METHOD OF ASSESSMENT

This Habitats Regulations Assessment was completed for the Isle of Grain to South Foreland Shoreline Management Plan (SMP) in advance of guidance being available. The Environment Agency Project Manager for the Medway Estuary and Swale Shoreline Management Plan Appropriate Assessment, Mark Smith, derived a method for undertaking the assessment to the satisfaction of internal parties and the relevant conservation body. National and local experts from the Environment Agency and Natural England informed the development of this method. This method is summarised in Table 2 and presented in Appendix 1 of this report.

This assessment was completed on the preferred SMP policies (derived following DEFRA Procedural Guidance, 2006) of the consultation draft of the plan in order to confirm the viability of the policies prior to public consultation. (NB; This is the completed stage of the Assessment at the time of drafting, although it will be updated and finalised for the Final SMP2 and is yet to be submitted to the Secretary of State for ratification).

As members of the Coastal Group producing the SMP, both Natural England (Relevant Conservation Body) and Canterbury City Council (Lead Authority for this SMP) produced the assessment in partnership. This partnership approach to the assessment is considered as vital to deriving a successful assessment that enables progression of a forward-looking SMP.

The assessment followed the usual four-stage approach. The method and the breakdown of roles are shown in Table 2. The detailed method is contained in Appendix A of this report.

Stage 3 of the assessment is undoubtedly the largest body of work. For the SMPs, it was not possible to avoid the need to map the change in the shoreline arising from the SMP policies from the best available information. This enables the effect to be quantified and analysed. If this information were not available, the assessment would tend to rely on conditions to avoid adverse effect that can only offer low confidence in the viability of the policy, the plan and on future compliance with the Habitats Regulations.

The mapping of the policies was also driven by other aspects of plan development thus it was done. GIS data and skills were central to this aspect of the assessment.

Table 2 – Isle of Grain to South Foreland SMP Habitats Regulations Assessment Method

Stage	Task	How	Who
1	Determine whether the plan is necessary for the site. Assess & agree the appropriate level of assessment and information required	Meeting	CCC & NE
2	Assess Likely Significant Effect of SMP policies. N.B. separate assessment per site and must include beneficial as well as adverse effects to inform later balanced assessment	Follow Table 1 of guidance	CCC
3	Quantify the significance of each effect. E.g. magnitude of Managed realignment/ No Active Intervention Policies affecting freshwater features, Magnitude of coastal squeeze caused or cliff erosion prevented by Hold the Line policies Programme the effects (good & bad) Assess cumulative effect of all policies on each site (magnitude and time)	Follow Table 2 of guidance and meetings	CCC (coastal assessment) NE (Freshwater Assessment)
	Assess the in combination effects Determine 'No Adverse' or 'Adverse' Effect Assess alternative policies where 'Adverse' effect derived		Both Partners
4	Determine Overriding Public Interest where there are no viable alternatives Quantify Compensation Submit assessment to Secretary of State (DEFRA)	Follow National guidance & Workshops	Both Partners

J1.5 SMP ROLES AND STAGE 1 ASSESSMENT

Stage 1 of the assessment was undertaken in a meeting between the Competent Authority (CCC) and Relevant Conservation body (NE). It was agreed that these authorities would undertake the assessment in partnership. To describe the roles simply, Canterbury City Council investigated and quantified the scale of the effect and Natural England, with their understanding of the sites, assessed the impact of that effect. Both Partners then worked together to best manage the effect.

At Stage 1 of the assessment Natural England advised that the plan was not necessary for the management of the site and a Habitats Regulations Assessment was required. Both the EA and NE agreed on the following level of detailed investigation and supporting information on which to base the assessment:

- SMP / North Kent CHaMP assessments of Coastal Processes & Most Sustainable Coast/ Estuary Alignment
- EA Review of Consents – Stage 1 information
- GT CHaMP Phase 1 Habitat Survey GIS Data set
- South East Plan Site Summary Tables
- Kent BRC Habitat Surveys (where relevant)
- SECG Habitat Mapping
- SRCMP LiDAR data
- SSSI Favourable Condition Information (to inform viability of site modification/ Priority Habitats/ Ramsar features)

It was agreed that it would be impractical and prohibitively expensive to assess the effect of the SMP on each interest feature unless this could not be avoided. The partnership agreed to assess the habitat level effects only unless this was deemed as not representative of all effects during the assessment.

The partnership agreed that the following plans would be considered in the 'In Combination' assessment:

Adjacent SMPs
Local plans/ LDFs
Thames Gateway Proposals
TE2100 Proposals
GT CHaMP

J1.6 BACKGROUND TO THE EUROPEAN SITES

Six sites that could be directly affected by the SMP were identified. These are:

- Thames Estuary & Marshes SPA & Ramsar Site
- The Swale SPA & Ramsar Site
- Thanet Coast and Sandwich Bay SPA & Ramsar Site
- Thanet Coast SAC
- Sandwich Bay SAC
- Dover to Kingsdown Cliffs SAC

Natural England and the Environment Agency agreed that assessment was required for each of these sites in Stage 1 (see Section 1.7). It was agreed that an assessment would be made for each site and the one assessment would cover all European designations for that site (SPA & Ramsar assessed in one).

A summary of these sites is in Table 3 below. More information can be found in the Appendix 11 & 12 proforma in Appendix D and E.

Table 3 – European Site Interest Features

Thames Estuary & Marshes SPA & Ramsar Site	<p><u>Special Protection Area</u> The following habitats are required in favourable condition to support the range of bird species for which the SPA is designated (indicative proportion of site %): Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins) (57.3%) Salt marshes. Salt pastures. Salt steppes (1.5%) Shingle. Sea cliffs. Islets (0.9%) Inland water bodies (standing water, running water) (5.6%) Bogs. Marshes. Water fringed vegetation. Fens (3.7%) Dry grassland. Steppes (1.9%) Humid grassland. Mesophile grassland (29.1%)</p> <p><u>Ramsar Site</u> The Thames Estuary and Marshes Ramsar site is a mosaic of intertidal habitats, saltmarsh, coastal grazing marshes, saline lagoons and chalk pits. The site provides wintering and breeding habitats for important assemblages of wetland bird species, particularly wildfowl and waders as well as supporting migratory birds on passage. The site also provides suitable conditions for a number of notable plants and invertebrates associated with these wetland habitats.</p>
The Swale SPA & Ramsar Site	<p><u>Special Protection Area</u> The following habitats are required in favourable condition to support the range of bird species for which the SPA is designated (indicative proportion of site %): Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins) (39%) Salt marshes. Salt pastures. Salt steppes (5%) Inland water bodies (standing water, running water) (2%) Other arable land (47%) Other land (including towns, villages, roads, waste places, mines, industrial sites) (6%)</p> <p><u>Ramsar Site</u> The following habitats are required in favourable condition to support the range of bird species for which the Ramsar site is designated (indicative proportion of site %): Sand / shingle shores (including dune systems) (1%) Tidal flats (38%) Salt marshes (5.8%) Rivers / streams / creeks: seasonal / intermittent (1.8%) Seasonally flooded agricultural land (47.7%) Other (5.7%)</p>
Thanet Coast and Sandwich Bay SPA and Ramsar Site	<p><u>Special Protection Area</u> The following habitats are required in favourable condition to support the range of bird species for which the SPA is designated (indicative proportion of site %): Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins) (83%) Coastal sand dunes. Sand dunes. Machair (1%) Shingle. Sea cliffs. Islets (1%) Humid grassland. Mesophile grassland (2%) Improved grassland (10%) Other arable land (3%)</p> <p><u>Ramsar Site</u> A coastal site, consisting of a long stretch of rocky shore, adjoining areas of estuary, sand dune, maritime grassland, saltmarsh and grazing marsh. The wetland habitats support 15 British Red Data Book invertebrates, as well as a large number of nationally scarce species. The site attracts internationally important numbers of turnstone <i>Arenaria interpres</i>, and nationally important numbers of nationally important wintering populations of four wader species: ringed plover, golden plover, grey plover and sanderling, as well as Lapland bunting. The site is used by large numbers of migratory birds.</p>

Thanet Coast SAC	<p><u>Special Areas of Conservation</u></p> <p>The following habitats are required in favourable condition to support the habitat types and species are those considered to be most in need of conservation at a European level (excluding birds) (indicative proportion of site %):</p> <ul style="list-style-type: none"> Marine areas. Sea Inlets (87%) Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins) (10%) Shingle. Sea cliffs. Islets (3%)
Sandwich Bay SAC	<p><u>Special Areas of Conservation</u></p> <p>The following habitats are required in favourable condition to support the habitat types and species are those considered to be most in need of conservation at a European level (excluding birds) (indicative proportion of site %):</p> <ul style="list-style-type: none"> Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins) (32%) Salt marshes. Salt pastures. Salt steppes (15%) Coastal sand dunes. Sand beaches. Machair (35%) Inland water bodies (standing water, running water) (1%) Bogs. Marshes. Water fringed vegetation. Fens (5%) Humid grassland. Mesophile grassland (5%) Improved grassland (10%) Coniferous woodland (1%)
Dover and Kingsdown Cliffs SAC	<p><u>Special Areas of Conservation</u></p> <p>The following habitats are required in favourable condition to support the habitat types and species are those considered to be most in need of conservation at a European level (excluding birds) (indicative proportion of site %):</p> <ul style="list-style-type: none"> Shingle. Sea cliffs. Islets (50%) Heath. Scrub. Maquis and garrigue. Phygrana (10%) Dry grassland. Steppes (39%) Other land (including towns, villages, roads, waste places, mines, industrial sites) (1%)

J2 Stage 2: Assessment of likely significant effect

J2.1 GENERIC EFFECTS CONTROLLABLE BY CONDITIONS – APPLICABLE TO ALL ASSESSMENTS

The Stage 2 assessment comprised of a generic assessment of control measures that could be applied to flood and coastal defence works to avoid adverse effect. This was undertaken with Natural England.

Effects: It was readily identified that the timing of works and the extent of the working area are key direct scheme level impacts that can be controlled.

Conditions: A generic condition applies to all assessments as follows: ‘works will be timed to avoid disturbance and the working area will be subject to detailed assessment to avoid damage.’

J2.2 SEQUENTIAL TEST OF POLICIES

For efficiency, the four SMP policies were tested against the designated sites using the method in Appendix A to identify significant effect. This only required an assessment of four scenarios compared to unit-by-unit assessments.

The full Stage 2 assessment of ‘Likely Significant Effect’ is contained in the Appendix 11 proforma in Appendix D.

J2.3 THAMES ESTUARY AND MARSHES SPA / RAMSAR

This site would be sensitive to estuarine habitat loss through the footprint of an Advance the Line policy or coastal squeeze from Hold the Line. The site would also be sensitive to freshwater and terrestrial habitat loss through Managed Realignment or No Active Intervention.

Policy Unit 4a01 of the SMP recommends a Hold the Line policy for the first epoch. This SMP policy is **likely to have a direct significant negative effect** on the intertidal habitats for this area. However, the policy for Epochs 2 & 3 is one of Managed Realignment, along part of the frontage. This is **likely to have a direct significant negative effect** on terrestrial and freshwater habitat, but a **likely direct significant positive effect** on the intertidal habitat.

J2.4 THE SWALE SPA / RAMSAR

This site would be sensitive to estuarine habitat loss through the footprint of an Advance the Line policy. The site would be sensitive to freshwater and terrestrial habitat loss through Managed Realignment or No Active Intervention.

Current studies show that the estuary is not suffering coastal squeeze from Hold the Line policies.

Policy Units 4a06 & 4a07 of the SMP recommend Managed Realignment, the former in Epoch 1 onwards, and the latter staggered over Epochs 2 & 3. These policies are **likely to have a direct**

significant negative effect on terrestrial and freshwater habitat, but are **likely to have a direct significant positive effect** on the intertidal habitat

J2.5 THANET COAST AND SANDWICH BAY SPA / RAMSAR

This site would be sensitive to intertidal habitat loss through the footprint of an Advance The Line policy or coastal squeeze from Hold The Line.

Policy Units 4a10, 4a11, 4a12, 4a13, 4a15, 4a16, 4a17, 4a18, 4a19, 4a20 & 4a22 all have Hold The Line policies, which are **likely to have a direct significant negative impact** on intertidal reef habitats. Policy Unit 4a14 is scheduled for Managed Realignment from Epoch 2 onwards, which is **likely to have a direct significant positive effect** on the intertidal habitat. Policy Unit 4a21 has a No Active Intervention policy in force, which is **likely to have a direct significant positive impact** on coastal dune habitat.

J2.6 THANET COAST SAC

This site would be sensitive to intertidal habitat loss through the footprint of an Advance The Line policy or coastal squeeze from Hold The Line.

Policy Units 4a15 – 4a20 recommend a Hold The Line policy, which is **likely to have a direct significant negative effect** on intertidal habitats. Policy Unit 4a14 is scheduled for Managed Realignment in Epoch 2, which is **likely to have a direct significant positive effect** on the intertidal habitat.

J2.7 SANDWICH BAY SAC

This site would be sensitive to intertidal habitat loss through the footprint of an Advance The Line policy or coastal squeeze from Hold The Line. The site would also be sensitive to freshwater and terrestrial habitat loss through Managed Realignment or No Active Intervention policies.

Policy Unit 4a21 has a No Active Intervention policy in force, which is **likely to have a direct significant positive impact** on coastal dune habitat.

As this assessment concludes no significant negative effect to the Sandwich Bay SAC, this is screened out as does not progress to Stage 3 assessment.

J2.8 DOVER TO KINGSDOWN CLIFFS SAC

This site would be sensitive to intertidal habitat loss through the footprint of an Advance The Line policy or coastal squeeze from Hold The Line.

However, this assessment concludes no significant negative effect to the Dover to Kingsdown Cliffs SAC, this is screened out as does not progress to Stage 3 assessment.

J3 Stage 3: Habitats Regulations Assessment

J3.1 INTRODUCTION

Stage 2 concluded that the plan could have a likely significant effect on the following European sites:

Thames Estuary & Marshes SPA / Ramsar
Thanet Coast & Sandwich Bay SPA / Ramsar
The Swale SPA / Ramsar
Thanet Coast SAC

Habitats Regulations Assessment was thus required for these sites.

J3.2 METHOD

The Habitats Regulations Assessment methodology described in Section 1 and included in Appendix A was followed to determine whether the plan would have an adverse effect on the integrity of these sites.

The scale of the effect of the SMP policies was assessed using 'Indicative Realignment Extents.' These mapped extents indicate a scale of change associated with SMP policies that change the alignment of the coast. They are drafted for each of the three SMP epochs and are derived from the best information available to the SMP relating to coastal (estuarine) processes, constraints and economic viability. The Indicative Realignment Extents are intended to provide a relative scale of change to better inform the use and public interpretation of the SMP Policies, they do not define the exact nature of the change. The actual realignment extents will be determined by more detailed study through coastal strategies and schemes.

The above is particularly important to note when considering the scales of change described in this assessment and the use of conditions to determine the acceptable scales of change to maintain the integrity of the designated sites.

J3.3 THAMES ESTUARY & MARSHES SPA & RAMSAR SITE

The Thames Estuary and Marshes are suffering loss of intertidal habitat through coastal squeeze. The intertidal habitat in this policy unit consists of a narrow coastal strip, and under sea level rise it has been assumed that the entire habitat in the designated area would be affected.

The adjacent Shoreline Management Plan and the Thames Estuary 2100 programme are both recommending managed realignment within this designated area. This management approach is likely to create significantly greater quantities of these habitats within the first epoch of the plan, and the in combination effect is critical to the final assessment (Section 3.7).

Although at the time of drafting this assessment, only the Medway Estuary and Swale Shoreline Management Plan (MESSMP) had undertaken a similar Habitats Regulations Assessment, this is the best available information for in combination assessment.

The Stage 2 assessment highlighted the likely significant effect of Managed Realignment Policies in Policy Unit 4a01 of the Shoreline Management Plan, inundating designated freshwater features. Following the Methodology in Appendix A, the losses and gains of designated habitat have been calculated, and are shown in Table 4. These habitat changes are also illustrated in the maps in Appendix B and C.

The assessment shows that there will be a net gain of saltmarsh and mudflat over the various time periods with a corresponding displacement of freshwater features.

Table 4 - Predicted habitat change in the Thames Estuary SPA / Ramsar at 4a01 resulting from Draft SMP Policies

Habitat description	Habitat Code	Habitat change by end of Epoch 1 (Ha)	Habitat change by end of Epoch 2 (Ha)	Habitat change by end of Epoch 3 (Ha)
Mudflat	LS	0	143.83	228.64
Saltmarsh	LS	0	86.11	4.61
Intertidal Total		0	229.94	233.25
Unclassified	Null	0	-0.001	-0.001
Standing open water	AS	0	-18.40	-18.40
Arable and horticulture	CR	-	-	-
Fen, marsh and swamp	EM	0	-3.47	-3.47
Improved grassland	GI	0	-0.01	-0.01
Neutral grassland	GN	0	-207.76	-210.79
Littoral Rock	LR	-	-	-
Littoral sediment	LS	0	-0.44	-0.56
Inland rock	RE	0	-0.07	-0.07
Supralittoral rock	SR	-	-	-
Supralittoral sediment	SS	-	-	-
Built-up areas and gardens	UR	0	-0.54	-0.55
Freshwater Total		0	-230.69	-233.85

J3.3.1 Policy Unit 4a01: Hold the Line (Epoch 1); Managed Realignment (Epochs 2 & 3)

The policy will increase the area of intertidal habitat, a beneficial effect on the integrity of the site.

The displacement of standing water features (AS) would have a resultant adverse effect on the designated invertebrate species and flora associated with the features. To avoid adverse effect on site integrity, surveys will be required to establish the distribution and health of these populations and any mitigation needs. For the policy to be implemented within the planned epoch, this will be required sufficiently in advance of the change in defence alignment.

The Neutral Grassland (GN -grazing marsh) component of the site at this policy unit supports good populations of wintering and breeding birds. At this policy unit, the displacement of grazing marsh and

associated bird populations due to tidal inundation of the site would cause an adverse effect on site integrity. This unit is assessed further in Sections 3.7 and 4.2 of this report.

J3.3.2 Conclusion

The Indicative Extents of SMP Managed Realignment policies for policy unit 4a01 will result in the creation of 233.25Ha intertidal habitat within this site but will displace and equivalent 233.85Ha of freshwater habitat from this site. However, it should be noted that the LiDAR data used to calculate the intertidal habitat creation area is incomplete for this site – there is a potential 48.4Ha that could be used for this purpose. It is expected that full LiDAR coverage will be available in mid-2009.

The creation of intertidal habitat from this policy is considered a **Beneficial Effect** on site integrity and important for the wider Natura 2000 network.

The displacement of the following freshwater habitats **can be controlled by conditions to cause No Adverse Effect**:

Policy Unit	Effect and Condition
4a01	The displacement of standing water features would have a resultant Adverse effect on the designated invertebrate species and flora associated with the features. To avoid Adverse effect on site integrity, surveys will be required to establish the distribution and health for these populations and any mitigation needs. For the policy to be implemented within the planned epoch, this will be required sufficiently in advance of the determination of, and change in defence alignment.

The displacement of the following freshwater habitats will cause **Adverse Effect**:

Policy Unit	Effect and Condition
4a01	The displacement of grazint marsh and associated bird populations due to tidal inundation of the site would cause an Adverse effect on site integrity.

The displacement of freshwater habitats under the recommended policies for policy unit 4a 01 have an **Adverse Effect on the Thames Estuary and Marshes SPA / Ramsar site that cannot be controlled by conditions**.

J3.4 THE SWALE SPA & RAMSAR

Studies used in the development of the MESSMP concluded that the Swale Estuary is experiencing net accretion rates greater than losses caused by coastal squeeze. There is a high level of confidence in the first two epochs of the study, leading to greater uncertainty in the third epoch.

This trend of intertidal habitat accretion is unique within the majority of the South East of England, as on a wider scale, intertidal habitats are declining. To maintain the interests of the wider Natura 2000 Habitat Network the importance of this area for these habitats should be duly noted. The areas of

accretion are focussed to certain parts of the estuary and certain policy units. These should be the focus of protection from detrimental activities in the future.

The Stage 2 assessment highlighted the likely significant effect of Managed Realignment Policies in Policy Units 4a06 & 4a07 of the Shoreline Management Plan, inundating designated freshwater features.

Following the Methodology in Appendix A, the losses and gains of designated habitat have been calculated, and are shown in Table 5. These habitat changes are also illustrated in the maps in Appendix B and C.

The assessment shows that there will be a net gain of saltmarsh and mudflat over the various time periods with a corresponding displacement of freshwater features.

Table 5 – Predicted habitat change in The Swale SPA / Ramsar at 4a06, 07a & 07b resulting from Draft SMP Policies

Habitat description	Habitat Code	Habitat change by end of Epoch 1 (Ha)	Habitat change by end of Epoch 2 (Ha)	Habitat change by end of Epoch 3 (Ha)
Mudflat	LS	23.25	104.53	440.34
Saltmarsh	LS	98.44	73.11	15.82
Intertidal Total		121.69	177.64	456.16
Unclassified	Null	-	-	-
Standing open water	AS	-11.43	-13.24	-23.49
Arable and horticulture	CR	-	-	-
Fen, marsh and swamp	EM	-4.35	-17.88	-24.65
Improved grassland	GI	-0.11	-0.39	-23.11
Neutral grassland	GN	-96.08	-141.66	-365.04
Littoral Rock	LR	-	-	-
Littoral sediment	LS	-1.37	-1.87	-2.43
Inland rock	RE	-	-	-
Supralittoral rock	SR	-	-	-
Supralittoral sediment	SS	-0.29	-0.81	-2.41
Built-up areas and gardens	UR	-0.67	-0.83	-3.28
Freshwater Total		-114.32	-176.69	-444.41

The Environment Agency/Natural England partnership has assessed the gain of intertidal features has a Beneficial Effect on the European site and the wider Natura 2000 network. The partnership concluded that the displacement of some freshwater features as an Adverse Effect on the whole European site. However, the displacement of some of the freshwater features can be controlled by conditions placed on the SMP policies and some displacement of freshwater features is acceptable modification to the site. The breakdown of this assessment, the relevant conditions and acceptable modification is summarised by policy unit as follows:

J3.4.1 Policy Unit 4a06: Managed Realignment (Epochs 1, 2 & 3)

The policy will increase the area of intertidal habitat, a beneficial effect on the integrity of the site.

The displacement of standing water features (AS) would have a resultant adverse effect on the designated invertebrate species and flora associated with the features. To avoid adverse effect on site integrity, surveys will be required to establish the distribution and health of these populations and any mitigation needs. For the policy to be implemented within the planned epoch, this will be required sufficiently in advance of the change in defence alignment.

The Neutral Grassland (GN -grazing marsh) component of the site at this policy unit supports good populations of wintering and breeding birds. At this policy unit, the displacement of grazing marsh and associated bird populations due to tidal inundation of the site would cause an adverse effect on site integrity. This unit is assessed further in Sections 3.7 and 4.2 of this report.

J3.4.2 Policy Unit 4a07a: Hold the Line (Epoch 1); Managed Realignment and Hold the Line (Epochs 2 & 3)

The policy will increase the area of intertidal habitat, a beneficial effect on the integrity of the site.

The displacement of Standing Water (AS) features would have a resultant adverse effect on the designated invertebrate species and flora associated with the features. To avoid adverse effect on site integrity, surveys will be required to establish the distribution and health of these populations and any mitigation needs. For the policy to be implemented within the planned epoch, this will be required sufficiently in advance of the change in defence alignment.

The Neutral Grassland (GN -grazing marsh) component of the site at this policy unit supports good populations of wintering and breeding birds. At this policy unit, the displacement of grazing marsh and associated bird populations due to tidal inundation of the site would cause an adverse effect on site integrity. This unit is assessed further in Sections 3.7 and 4.2 of this report.

J3.4.3 Policy Unit 4a07b: Hold the Line (Epochs 1 & 2); Managed Realignment and Hold the Line (Epoch 3)

The policy will increase the area of intertidal habitat, a beneficial effect on the integrity of the site.

The displacement of standing water features (AS) would have a resultant adverse effect on the designated invertebrate species and flora associated with the features. To avoid adverse effect on site integrity, surveys will be required to establish the distribution and health of these populations and any mitigation needs. For the policy to be implemented within the planned epoch, this will be required sufficiently in advance of the change in defence alignment.

The Neutral Grassland (GN -grazing marsh) component of the site at this policy unit supports good populations of wintering and breeding birds. At this policy unit, the displacement of grazing marsh and associated bird populations due to tidal inundation of the site would cause an adverse effect on site integrity. This unit is assessed further in sections Sections 3.7 and 4.2 of this report.

J3.4.4 Conclusion

The SMP policies for Policy Units 4a 06, 4a 07a and 4a 07b will result in the creation of 456.16ha of intertidal habitat within this site but will displace 444.42Ha of Freshwater Habitat from this site.

The creation of intertidal habitat from each of these policies is considered a Beneficial Effect on site integrity and important for the wider Natura 2000 network. The displacement of the following freshwater habitats represents can be controlled by conditions to cause No Adverse Effect:

Policy Unit	Effect & Condition
4a06	The displacement of standing water features would have a resultant Adverse effect on the designated invertebrate species and flora associated with the features. To avoid Adverse effect on site integrity, surveys will be required to establish the distribution and health of these populations and any mitigation needs. For the policy to be implemented within the planned epoch, this will be required sufficiently in advance of the determination of, and change in defence alignment.
4a07a	
4a07b	

The displacement of the following freshwater habitats will cause **Adverse Effect**:

Policy Unit	Effect & Condition
4a06	The displacement of grazing marsh and associated bird populations due to tidal inundation of the site would cause an Adverse effect on site integrity.
4a07a	
4a07b	

J3.5 THANET COAST & SANDWICH BAY SPA & RAMSAR SITE

Much of this coastline has been recommended for a long-term Hold the Line policy. This is likely to accelerate the process of coastal squeeze, causing the narrowing of inter-tidal areas as sea levels rise. This is especially significant along the Isle of Thanet coastline, which is characterised by chalk reefs. Without a regular supply of material from eroding chalk cliffs, the reef will be significantly affected by sea level rise.

In addition, there are two sites of No Active Intervention (4a13 and 4a21) within this designated area, and which are categorised as 'natural change'. As such, they cannot be used as part of the In Combination assessment. However, the managed realignment section at 4a14 will benefit the shingle shore, which is a sub-feature of the SPA / Ramsar designation.

Following the Methodology in Appendix A, the losses and gains of designated habitat have been calculated, and are shown in Table 6. These habitat changes are also illustrated in the maps in Appendix B and C. In addition, the chalk reef has been analysed as a whole, instead of breaking it down into policy units (Figure 3.1, Table 7)

The assessment shows that there will be a net gain of saltmarsh and mudflat over the various time periods with a corresponding displacement of freshwater features.

Table 6– Predicted habitat change in Thanet Coast & Sandwich Bay SPA / Ramsar at 4a14 resulting from Draft SMP Policies

Habitat description	Habitat Code	Habitat change by end of Epoch 1 (Ha)	Habitat change by end of Epoch 2 (Ha)	Habitat change by end of Epoch 3 (Ha)
Mudflat	LS	0	0.79	4.56
Saltmarsh	LS	0	3.36	6.81
Intertidal Total		0	4.15	11.37

Table 7 – Predicted erosion rates for chalk cliffs in the Thanet Coast & Sandwich Bay SPA / Ramsar resulting from Draft SMP Policies

Sector	Cumulative area lost to erosion (Ha)		
	Epoch 1	Epoch 2	Epoch 3
1	0.03	0.08	0.17
2	0.45	0.93	2.19
3	0.29	0.58	1.05
4 (excl. Ramsgate Harbour)	0.62	1.25	2.17
5	0.21	0.37	0.66
6	0.40	1.15	2.88
7	0.23	0.45	0.72
8	0.31	0.60	1.10
9	0.19	0.37	0.60
10	0.10	0.20	0.35
11	0.06	0.28	0.45
12	0.06	0.12	0.38
13	0.41	1.37	3.62
14A	0.09	0.19	0.33
14B	0.20	0.42	1.18
15	0.57	1.48	1.48
16	0.12	0.75	1.25
17	0.36	1.10	2.07
18	0.50	1.85	3.72
19	0.06	0.22	0.48
20	0.99	3.06	5.96
Total erosion	6.25	16.81	32.81
Actual erosion	1.40	3.69	8.77
Potential erosion	4.85	13.13	24.04

J3.5.1 Revised figures following Natural England advice

Following discussions between DEFRA and Canterbury City Council, further advice was sought from Natural England regarding the scale of losses of the chalk reef associated with the SMP policies (see Appendix I). The Appropriate Assessment estimates given in Table 7 were re-evaluated, and the revised figures are shown in Table 8. Additionally, the advice provided by Natural England looked at the impact of coastal squeeze on the reef resulting from chalk platform lowering. Predictions show that 200ha of inter-tidal reef will change to sub-tidal over the 100 year period covered by this assessment. As this is not the result of SMP policies, it is therefore classified as natural change.

Table 8 – Revised erosion rates for chalk cliffs in the Thanet Coast & Sandwich Bay SPA / Ramsar resulting from Draft SMP Policies

	Habitat change by end of Epoch 1 (Ha)	Habitat change by end of Epoch 2 (Ha)	Habitat change by end of Epoch 3 (Ha)
Actual erosion due to NAI policy	2.64	6.28	15.49
Total erosion due to NAI & HTL policies	4.90	14.11	26.41
Potential erosion	-2.26	-7.83	-10.92

These revised figures were then taken to Natural England's legal team to establish whether or not they constitute an adverse effect on the chalk reef habitat. The advice received was that the areas of potential gain created as a result of cliff erosion would be formed outside the current boundary of the SPA & Ramsar site. Therefore, any adverse effect predicted as a result of the prevention of habitat creation would not apply.

J3.5.2 Policy Unit 4a14: Hold the Line (Epoch 1); Managed Realignment (Epochs 2 & 3)

The policy will increase the area of intertidal habitat, a beneficial effect on the integrity of the site.

J3.5.3 Policy Units 4a15, 4a16, 4a17, 4a18, 4a19 and 4a20; Hold the Line, and No Active Intervention where no defences are in place (Epochs 1, 2 & 3)

The policies for these units will affect the supply of material available to the intertidal zone for the creation of chalk reef habitat, depending on whether or not the cliffs are defended.

The No Active Intervention policies across the whole site will increase the area available for intertidal reef habitat by 15.49Ha by the end of Epoch 3. The Hold the Line policies across the whole site will prevent 10.92Ha of intertidal habitat creation by the end of Epoch 3. Based on the revised advice from Natural England, both the actual and prevented gain of chalk reef is outside the SPA & Ramsar site, and therefore has no actual or potential effect on the existing designated chalk reef habitat.



Thanet Coast chalk reef

Figure 3.1

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J3.5.4 Conclusion

The SMP policies for Policy Unit 4a14 will result in the creation of 11.37Ha of intertidal habitat within this site. The creation of intertidal habitat from each of these policies is considered a Beneficial Effect on site integrity and important for the wider Natura 2000 network.

The SMP No Active Intervention policies within Policy Units 4a15 – 4a20 will result in an increase of 15.49Ha of material available for intertidal reef habitat creation.

The SMP Hold the Line policies within Policy Units 4a15 – 4a20 will prevent 10.92Ha of intertidal habitat creation by the end of Epoch 3. This prevented gain of potential chalk reef cannot be controlled by conditions; however, because the actual and prevented gain of chalk reef is outside the SPA & Ramsar site, and therefore has no actual or potential effect on the existing designated chalk reef habitat, it is concluded that these policies have **No Adverse Effect** on site integrity.

The official position on the policies affecting this area is as follows;

General Obligations to avoid deterioration of European sites.

As shown through the appropriate assessment, the extent of intertidal chalk reef will deteriorate over the duration of the SMP. Although this deterioration is outside of the remit of the SMP, there is an obligation on all Member States to take appropriate steps to avoid, in European sites, the deterioration of natural habitats for which the areas have been designated. This applies in so far as such deterioration could be significant in relation to the objectives of the Directive to ensure 'favourable conservation status' of habitats and species. If influences acting on the site, result in making the conservation status of the habitat less favourable than it was before, then deterioration can be considered to have occurred, contrary to the Directive and its general aims.

Conservation status of a natural habitat is considered favourable on the basis that 1) the natural range and area it covers, is stable or increasing, 2) the specific structure and functions that are necessary for its long term maintenance exist, and are likely to continue to exist in the foreseeable future and 3) the conservation status of its typical species is favourable.

All measures taken pursuant to the Directive should be designed to ensure favourable conservation status of natural habitats and species.

J3.6 THANET COAST SAC

Encompassing the length of the Isle of Thanet coastline, the majority of this designated area follows a policy of Hold the Line. As mentioned in Section J3.5, this will have a significant effect on the chalk reef. There are some sites where there are no defences in front of the cliffs, and it is recommended that these sections follow a policy of No Active Intervention. As a result, they also cannot be used for In Combination assessments.

Apart from a small area of 4a14 (<10ha), there are no managed realignment sites within the Thanet Coast SAC. The Stage 2 assessment highlighted the likely significant effect of Managed Realignment Policies in Policy Unit 4a14 of the Shoreline Management Plan, inundating designated freshwater features.

Following the Methodology in Appendix A, the losses and gains of designated habitat have been calculated, and are shown in Table 9. These habitat changes are also illustrated in the maps in Appendix B and C. In addition, the chalk reef has been analysed as a whole, instead of breaking it down into policy units (Figure 3.1, Table 10)

The assessment shows that there will be a net gain of saltmarsh and mudflat over the various time periods with a corresponding displacement of freshwater features.

Table 9 – Predicted habitat change in Thanet Coast SAC at 4a14 resulting from Draft SMP Policies

Habitat description	Habitat Code	Habitat change by end of Epoch 1 (Ha)	Habitat change by end of Epoch 2 (Ha)	Habitat change by end of Epoch 3 (Ha)
Mudflat	LS	0	0.10	0.17
Saltmarsh	LS	0	0.08	0.60
Intertidal Total		0	0.18	0.77

Table 10 – Predicted erosion rates for chalk cliffs in the Thanet Coast SAC resulting from Draft SMP Policies

Sector	Cumulative area lost to erosion (Ha)		
	Epoch 1	Epoch 2	Epoch 3
1	0.03	0.08	0.17
2	0.45	0.93	2.19
3	0.29	0.58	1.05
4 (excl. Ramsgate Harbour)	0.62	1.25	2.17
5	0.21	0.37	0.66
6	0.40	1.15	2.88
7	0.23	0.45	0.72
8	0.31	0.60	1.10
9	0.19	0.37	0.60
10	0.10	0.20	0.35
11	0.06	0.28	0.45
12	0.06	0.12	0.38
13	0.41	1.37	3.62
14A	0.09	0.19	0.33
14B	0.20	0.42	1.18
15	0.57	1.48	1.48
16	0.12	0.75	1.25
17	0.36	1.10	2.07
18	0.50	1.85	3.72
19	0.06	0.22	0.48
20	0.99	3.06	5.96
Total erosion	6.25	16.81	32.81
Actual erosion	1.40	3.69	8.77
Potential erosion	4.85	13.13	24.04

J3.6.1 Revised figures following Natural England advice

Following discussions between DEFRA and Canterbury City Council, further advice was sought from Natural England regarding the scale of losses of the chalk reef associated with the SMP policies (see Appendix I). The Appropriate Assessment estimates given in Table 10 were re-evaluated, and the revised figures are shown in Table 11. Additionally, the advice provided by Natural England looked at the impact of coastal squeeze on the reef resulting from chalk platform lowering. Predictions show that 200ha of inter-tidal reef will change to sub-tidal over the 100 year period covered by this assessment. As this is related to the SMP policies, it is therefore classified as natural change.

These revised figures were then taken to Natural England's legal team to establish whether or not they do constitute an adverse effect on the chalk reef habitat. The advice received was that the areas of potential gain as a result of cliff erosion would be formed outside the current boundary of the SAC. Therefore, any adverse effect predicted as a result of the prevention of habitat creation would not apply.

Table 11 – Revised erosion rates for chalk cliffs in the Thanet Coast SAC resulting from Draft SMP Policies

	Habitat change by end of Epoch 1 (Ha)	Habitat change by end of Epoch 2 (Ha)	Habitat change by end of Epoch 3 (Ha)
Actual erosion due to NAI policy	2.64	6.28	15.49
Total erosion due to NAI & HTL policies	4.90	14.11	26.41
Potential erosion	-2.26	-7.83	-10.92

J3.6.2 Policy Unit 4a14: Hold the Line (Epoch 1); Managed Realignment (Epochs 2 & 3)

The policy will increase the area of intertidal habitat, a beneficial effect on the integrity of the site.

J3.6.3 Policy Units 4a15, 4a16, 4a17, 4a18, 4a19 and 4a20; Hold the Line, and No Active Intervention where no defences are in place (Epochs 1, 2 & 3)

The policies for these units will affect the supply of material available to the intertidal zone for the creation of chalk reef habitat, depending on whether or not the cliffs are defended.

The No Active Intervention policies across the whole site will increase the area available for intertidal reef habitat by 15.49Ha by the end of Epoch 3. The Hold the Line policies across the whole site will prevent 10.92Ha of intertidal habitat creation by the end of Epoch 3. Based on the revised advice from Natural England, both the actual and prevented gain of chalk reef is outside the SPA & Ramsar site, and therefore has no actual or potential effect on the existing designated chalk reef habitat.

J3.6.4 Conclusion

The SMP policies for Policy Unit 4a14 will result in the creation of 11.37Ha of intertidal habitat within this site. The creation of intertidal habitat from each of these policies is considered a Beneficial Effect on site integrity and important for the wider Natura 2000 network.

The SMP No Active Intervention policies within Policy Units 4a15 – 4a20 will result in an increase of 15.49Ha of material available for intertidal reef habitat creation.

The SMP Hold the Line policies within Policy Units 4a15 – 4a20 will prevent 10.92Ha of intertidal habitat creation by the end of Epoch 3. This prevented gain of potential chalk reef cannot be controlled by conditions; however, because the actual and prevented gain of chalk reef is outside the SPA & Ramsar site, and therefore has no actual or potential effect on the existing designated chalk reef habitat, it is concluded that these policies have **No Adverse Effect** on site integrity.

The official position on the policies affecting this area is as follows;

General Obligations to avoid deterioration of European sites.

As shown through the appropriate assessment, the extent of intertidal chalk reef will deteriorate over the duration of the SMP. Although this deterioration is outside of the remit of the SMP, there is an obligation on all Member States to take appropriate steps to avoid, in European sites, the deterioration of natural habitats for which the areas have been designated. This applies in so far as such deterioration could be significant in relation to the objectives of the Directive to ensure 'favourable conservation status' of habitats and species. If influences acting on the site, result in making the conservation status of the habitat less favourable than it was before, then deterioration can be considered to have occurred, contrary to the Directive and its general aims.

Conservation status of a natural habitat is considered favourable on the basis that 1) the natural range and area it covers, is stable or increasing, 2) the specific structure and functions that are necessary for its long term maintenance exist, and are likely to continue to exist in the foreseeable future and 3) the conservation status of its typical species is favourable.

All measures taken pursuant to the Directive should be designed to ensure favourable conservation status of natural habitats and species.

J3.7 IN COMBINATION ASSESSMENT

The effects of the following plans and projects on the designated sites were considered in combination with the effects of the Shoreline Management Plan:

Medway Estuary and Swale SMP2
Thames Estuary 2100
South East Plan & Local Development Frameworks
Thames Gateway Proposal
Greater Thames CHaMP
Faversham Creek to Whitstable Harbour Coastal Defence Strategy Plan (2004)
Pegwell Bay to Kingsdown Cliffs Coastal Strategy Plan (2008)
Isle of Sheppey Strategy plan (1998)
Tankerton Coastal Strategy (1996, 2004)
Reculver to Minnis Bay Coastal Strategy (1998)
Faversham Road Coastal Strategy (2008)
Swalecliffe Coastal Strategy (in preparation)
Herne Bay Coastal Strategy (post-Swalecliffe strategy)

J3.7.1 Medway Estuary and Swale SMP2

The Medway Estuary and Swale SMP promotes Managed Realignment for Policy Units E402, 04, 15, 18 & 20 in the first epoch, and for E414 & 28 in the second epoch, within the Medway Estuary & Marshes SPA / Ramsar. In addition, Policy Units E425 & 26 are scheduled for Managed Realignment in the first epoch, and E423 in the second epoch, within the Swale SPA / Ramsar.

In combination with the MESSMP2, the Open Coast SMP2 **does not have an Adverse effect** on the integrity of the intertidal habitat of the Thames Estuary & Marshes SPA / Ramsar or The Swale SPA / Ramsar sites.

However, in combination with the MESSMP2 it **does have an Adverse effect** on the integrity of the freshwater habitat of the Thames Estuary & Marshes SPA / Ramsar or The Swale SPA / Ramsar sites.

In addition, in combination with the MESSMP, the Open Coast SMP compensates for the 1.5Ha of coastal squeeze caused to the Thames Estuary & Marshes SPA / Ramsar or The Swale SPA / Ramsar sites by the MESSMP.

J3.7.2 Thames Estuary 2100

The Thames Estuary 2100 project is not yet far enough advanced to define a clear picture of its recommendations. Early conceptual options for the plan concur with the Open Coast SMP2.

Note to Future Workers: The significance of coastal squeeze the displacement of freshwater habitat from the Thames Estuary 2100 is not yet known. The 'In Combination' effect of the SMP with the

bounding plan will require review once these plans are more developed. The TE2100 project team will be informed to refer to this assessment for future project development.

J3.7.3 South East Plan, Thames Gateway Proposal & Local Development Frameworks

The South East Plan has been developed with Habitats Regulations Assessment. All planning proposals within the plan are subject to a generic Habitats Regulations Assessment that negates or places conditions on any proposal that could affect a European site to ensure no adverse effect. This assessment cascades to the other plans.

There should be no additional Adverse Effect from in combination with these plans.

Note to Future Workers: These are high level plans and the significance of the development recommended under these plans is not yet known. The SMP recommends displacement of freshwater features adjacent to some areas of development allocation. The detailed interface of these cumulative impacts should be at the forefront of any subsequent Flood and Coastal Erosion Management Plan or Project and Development Proposal.

J3.7.4 Greater Thames CHaMP

At commencement of this assessment in early 2008, this project was still in a stage of development, hence in Stage 1, the adopted North Kent CHaMP (2002) was agreed to underpin the scope of this assessment.

The Greater Thames CHaMP has now been drafted and will be adopted in late-2008. The plan has reviewed the North Kent CHaMP (2002) trends, and predicted new erosion and accretion trends. This has changed the forecast used to underpin this HRA so far. As best available information, the Greater Thames CHaMP has been used to finalise this HRA

J3.7.5 Faversham Creek to Whitstable Harbour Coastal Defence Strategy Plan; Pegwell Bay to Kingsdown Cliffs Coastal Strategy Plan.

The main objective of the Faversham Creek to Whitstable Harbour Coastal Defence Strategy Plan is to develop a coastal defence management strategy for the coastline between Faversham Creek and Whitstable Harbour for the next hundred years. The aim of this strategy plan is to identify the most suitable way of managing the coastal defences and, where appropriate, protect the land from flooding, erosion and environmental degradation.

An essential requirement of this report is to ensure that the proposals are sustainable and work with the natural environment. Coupled with this is the need to protect, and where possible enhance the numerous environmental and nature conservation areas that exist along almost the entire study area.

As part of the Faversham Creek to Whitstable Harbour Coastal Defence Strategy Plan, an Environmental Impact Study was carried out. The purpose of the Impact Study was to expand upon the work carried out in the original North Kent SMP1 by increasing the level of understanding of

coastal processes, land use and environmental issues within the study area. This allowed a more comprehensive assessment of the most appropriate method of managing the coastal and tidal defences in the future with the aim of producing a sustainable defence policy.

The Pegwell Bay to Kingsdown Cliffs Coastal Strategy Plan (CSP) is designed to develop a strategy for managing coastal flooding and erosion between Pegwell Bay and the Ministry of Defence rifle range at Oldstairs Bay, as well as tidal flooding on the River Stour downstream of Fordwich. The strategy also aims to develop the flood management policies set out in this SMP and the River Stour Catchment Flood Management Plan.

The report includes a Strategic Environmental Assessment Report, which is designed to identify (at a strategic level) the likely effect on the biological, physical and geomorphological environment, and for human beings and property, arising from the implementation of the strategy.

In addition, the Isle of Sheppey Strategy Plan (1998), Tankerton Coastal Strategy (1996, 2004), Reculver to Minnis Bay Coastal Strategy (1998), Faversham Road Coastal Strategy (2008), Swalecliffe Coastal Strategy (in preparation) and Herne Bay Coastal Strategy (post-Swalecliffe strategy) all agree with SMP policies.

Therefore, there should be no additional Adverse Effect from in combination with these plans.

J3.8 CUMULATIVE IN-COMBINATION EFFECT ACROSS THE NATURA 2000 NETWORK

Within the Indicative Alignment Extents, the SMP recommends 1719.93Ha of Managed Realignment, of which 801.39Ha will affect the Natura 2000 network in and around North and East Kent.

Intertidal Habitats: The realignments would create 673.54Ha of mudflat and 27.24Ha of saltmarsh within the Natura 2000 sites over the 100-year life of the plan, evolving over time as follows:

Habitat	Epoch 1 (0-20 years)	Epoch 2 (20-50 years)	Epoch 3 (50-100 years)
Mudflat (Ha)	23.25	249.25	673.71
Saltmarsh (Ha)	98.44	162.66	27.84

NB: The figures in this table are non-cumulative, and do not include the 48.4Ha missing from the LiDAR data at the Allhallows realignment site.

Freshwater Habitats: The realignments would displace 43.07Ha of standing water features and 603.95Ha of grazing marsh, reducing over time as follows:

Habitat	Epoch 1 (0-20 years)	Epoch 2 (20-50 years)	Epoch 3 (50-100 years)
Standing water (Ha)	11.43	31.64	41.89
Grazing marsh (Ha)	96.08	349.42	575.83

NB: The figures in this table are cumulative.

In combination with the SMP policies on other European Sites, the plan has a major cumulative **Beneficial Effect on the Intertidal Habitat within the Natura Network**.

Alone, it has been identified that the displacement of **Standing Water features** can be locally controlled through application of conditions. However, in combination across both the Thames Estuary & Marshes and The Swale SPA / Ramsar sites, the scale of change represents an **Adverse effect to the Natura 2000 network** that cannot be controlled by conditions.

The displacement of a large area of **Grazing Marsh** through managed realignment, represents a major **Adverse effect to the Natura 2000 network** that cannot be controlled by conditions.

J3.9 FINAL HABITATS REGULATIONS ASSESSMENT CONCLUSION

J3.9.1 Thames Estuary & Marshes SPA / Ramsar

The SMP policy for Policy Unit 4a01 will result in the creation of 233.25Ha of intertidal habitat within this site, but will displace an equivalent amount of freshwater habitat from this site. However, it should be noted that the LiDAR data used to calculate the intertidal habitat creation area is incomplete for this site – there is a potential 48.4Ha that could be used for this purpose. It is expected that full LiDAR coverage will be available in mid-2009.

The creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network.

On the assessed extent of managed realignment, and based on the information available, it is not possible to demonstrate that the SMP does not have an **Adverse effect** due to the displacement of the following freshwater habitats;

Policy Unit	Effect & Condition
4a01	In combination with The Swale SPA / Ramsar, the displacement of standing water features and associated invertebrate species and flora would have a resultant Adverse effect on site integrity The displacement of grazing marsh and associated bird populations due to tidal inundation of the site would cause an Adverse effect on site integrity.

As the assessment of the plan cannot conclude no adverse effect to the Thames Estuary & Marshes SPA / Ramsar that cannot be controlled conditions or use of alternatives, it therefore progresses to Stage 4 assessment.

J3.9.2 The Swale SPA / Ramsar

The SMP policy for Policy Units 4a06, 07a, 07b, 08 & 09 will result in the creation of 456.16Ha of intertidal habitat within this site, but will displace an equivalent amount of freshwater habitat from this site.

The creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network.

On the assessed extent of managed realignment, and based on the information available, it is not possible to demonstrate that the SMP does not have **Adverse effect** due to the displacement of the following freshwater habitats;

Policy Unit	Effect & Condition
4a06	In combination with the Thames Estuary & Marshes SPA / Ramsar, the displacement of standing water features and associated invertebrate species and flora would have a resultant adverse effect on site integrity
4a07a	
4a07b	
	The displacement of grazing marsh and associated bird populations due to tidal inundation of the site would cause an adverse effect on site integrity.

As the assessment of the plan cannot conclude no adverse effect to The Swale SPA / Ramsar that cannot be controlled through conditions or use of alternatives, it therefore progresses to Stage 4 assessment.

J3.9.3 Thanet Coast & Sandwich Bay SPA / Ramsar

The SMP No Active Intervention policies within Policy Units 4a15 – 4a20 will result in an increase of 15.49Ha of material available for intertidal reef habitat creation.

The SMP policies for Policy Unit 4a14 will result in the creation of 11.37Ha of intertidal habitat within this site. The creation of intertidal habitat from each of these policies is considered a Beneficial Effect on site integrity and important for the wider Natura 2000 network.

The SMP Hold the Line policies within Policy Units 4a15 – 4a20 will prevent 10.92Ha of intertidal habitat creation by the end of Epoch 3. This prevented gain of potential chalk reef cannot be controlled by conditions; however, because the actual and prevented gain of chalk reef is outside the SPA & Ramsar site, and therefore has no actual or potential effect on the existing designated chalk reef habitat, it is concluded that these policies have **No Adverse Effect** on site integrity.

J3.9.4 Thanet Coast SAC

The SMP No Active Intervention policies within Policy Units 4a15 – 4a20 will result in an increase of 15.49Ha of material available for intertidal reef habitat creation.

The SMP policies for Policy Unit 4a14 will result in the creation of 11.37Ha of intertidal habitat within this site. The creation of intertidal habitat from each of these policies is considered a Beneficial Effect on site integrity and important for the wider Natura 2000 network.

The SMP Hold the Line policies within Policy Units 4a15 – 4a20 will prevent 10.92Ha of intertidal habitat creation by the end of Epoch 3. This prevented gain of potential chalk reef cannot be controlled by conditions; however, because the actual and prevented gain of chalk reef is outside the SAC, and

therefore has no actual or potential effect on the existing designated chalk reef habitat, it is concluded that these policies have **No Adverse Effect** on site integrity.

J3.9.5 Sandwich Bay SAC

This site was screened out at Stage 2. The SMP has no likely significant effect on this site.

J3.9.6 Dover to Kingsdown Cliffs SAC

This site was screened out at Stage 2. The SMP has no likely significant effect on this site.

J4 Stage 4: Approval or Refusal of Plan

J4.1 ALTERNATIVES

On the assessed extents of managed realignment and based on the information available, the SMP has an **Adverse Effect on the Thames Estuary and Marshes SPA / Ramsar and the Swale SPA/ Ramsar** caused by Grazing Marsh and Standing Water Habitat displacement through Managed Realignment. This cannot be controlled by conditions, mitigated nor has it been countered 'In Combination' with other plans.

Alternatives policies were assessed as part of policy appraisal within the SMP. The SMP has determined Managed Realignment and Hold the Line as the most sustainable way to manage the estuary shoreline into the future to meet wider social, economic and environmental objectives. The SMP has investigated the following in deriving this conclusion:

- a. The future evolution of the coast with sea level rise
- b. The ideal most natural form of the coast
- c. The Issues and Objectives of all stakeholders associated with coastal management and the coastal plain within the SMP area
- d. The primary constraints relating to infrastructure, property, people and the environment.

To assess alternatives, the policy appraisal and Stage 2 assessment was revisited with full consideration of Grazing Marsh (neutral grassland) protection. The lead competent authority then consulted Natural England as 'appropriate conservation body' on the remaining viable alternatives in order to identify the least damaging alternative.

The findings of the alternatives assessment are as follows:

J4.1.1 Grazing Marsh

J4.1.1.1 Alternatives – No Active Intervention

No Active Intervention would have an Adverse Effect on the sites in any epoch of the plan through uncontrolled freshwater habitat displacement. It would also lead to destabilisation of the geomorphology of the coast leading to increased erosion and flood risk throughout the estuary and likely damage of coastal habitats.

This is not a viable alternative and was not taken further.

J4.1.1.2 Alternatives – Advance The Line

Advance the Line would have an Adverse Effect on the sites in any epoch of the plan through footprint displacement of intertidal habitat.

This is not a viable alternative and was not taken further.

J4.1.1.3 Alternatives – Hold The Line

For the Swale SPA / Ramsar, in the first two epochs, following the 2002 North Kent CHaMP predictions, there is some confidence that a Hold the Line Policy would not have an Adverse Effect on these intertidal accreting sites. As such, Natural England was consulted on this alternative. Their response is detailed in Section 4.1.2.

Hold the Line would have an adverse effect on the Thames Estuary and Marshes SPA / Ramsar in all epochs of the plan through coastal squeeze of intertidal habitat. This is not a viable alternative, and was not taken further.

J4.1.1.4 Alternatives – Managed Realignment with a Controlled Extent (to minimise ecological impact)

The assessment of Managed Realignment policies so far has been based on 'Indicative Realignment Extents.' This provided a method of quantifying the effect of the Managed Realignment and Managed Realignment with Hold the Line Policies. These extents have been derived from the best available information as a guide for consultation and the Habitats Regulations Assessment. The extents were derived from:

- Coastal process understanding: The best coastal alignment for the future to deliver the SMP policies
- Coastal plain constraints: The location of designated habitat, built property and infrastructure
- Affordability: An affordable defence alignment

These extents are not fixed and will be subject to a much greater detail of study to fully understand the technical, economic and environmental impacts and opportunities.

The extents could be changed to implement managed realignment policies without adverse effect or with adverse effect but in a way that best manages site integrity.

As such, Natural England were consulted on this alternative. Their response is detailed in Section 4.1.2.

J4.1.1.5 Alternatives – Different Managed Realignment Timescale

Prior to the development of the Habitats Regulations Assessment, the timing of the managed realignment policy for Policy Unit 4a07 was changed. The unit was split in half at The Sportsman Pub, with 4a07a being realigned in Epoch 2, and 4a07b in Epoch 3. This was in response to the public consultation carried out for the Open Coast SMP.

Following the policy that non-designated freshwater habitat be realigned before designated, it could be argued that Policy Unit 4a07a be realigned in Epoch 1, as most of this section of the realignment area is not designated. However, Canterbury City Council and Natural England are recommending two factors that negate this policy. Firstly, the cost of breaching the seawall early, the delay to the Open Coast SMP for further public consultation was considered as part of this assessment. Secondly, and perhaps more crucially, there is already enough realigned non-designated habitat to compensate for the realigned designated habitat lost in Epoch 1.

As such, Natural England were consulted this alternative. Their response is detailed in Section 4.1.2.

J4.1.1.6 Alternatives – Additional Realignment Policies outside Natura 2000 sites

The SMP already recommends this policy in a number of locations outside Natura 2000 sites where it is the best policy and meets the objectives of the SMP.

In other areas, the Managed Realignment Policy has been assessed along with all other policies for each section of coastline covered by the plan.

The SMP recommends Managed Realignment in 6 of 27 policy units, Hold the Line in 17 of 27 policy units and No Active Intervention in 9 of 27 policy units.

In revisiting Hold the Line policies in undesignated areas and assessing whether their policy should change to Managed Realignment, Hold the Line remains justified for one or more of the following reasons:

- The policy benefits the overall management of coastal form or evolution with ongoing sea level rise.
- Hold the Line is necessary to meet wider social, economic or environmental objectives.
- Hold the Line is necessary to protect nationally or regionally important infrastructure, property, people and / or environmental assets.

J4.1.2 Natural England Advice on Least Damaging Alternative

The competent authority identified the following less damaging alternatives:

- a) Hold the Line, or
- b) Managed Realignment with a Controlled Extent (to minimise ecological impact)

Natural England were invited to formally advise on the least damaging of these alternatives and requested that the most timescales of the policies be considered. The advice from Natural England was as follows:

J4.1.2.1 Hold the Line

Based on the best available information recently produced under the Greater Thames Coastal Habitat Management Plan (CHaMP) project, Hold the Line is now considered a damaging policy within all epochs due to its predicted loss of intertidal habitat through coastal squeeze. Natural England does not consider Hold the Line to be the least damaging alternative for any epoch of the plan based on this information.

J4.1.2.2 Managed Realignment With a Controlled Extent

Following a review of the SMP policies within and outside the designated areas plus their respective timing, Managed Realignment with a Controlled Extent (to minimise ecological impact) **is the least damaging alternative** for all Managed Realignment Policies affecting the designated sites.

J4.1.2.3 Timing and Coastal Squeeze Compensation Outside Designated Areas

With respect to timing and coastal habitat gains outside designated areas, the scales of coastal squeeze losses predicted by the Greater Thames CHaMP within the first epoch are greater than the potential Coastal Habitat gains in suitable undesignated areas within the whole SMP area. As such, both the Competent Authority and Natural England agree that the least damaging alternative will have to change the current composition of the Natura sites affected by the SMP. In turn, both parties agree that the SMP is likely to have an adverse effect in the first and latter epochs of the plan.

J4.2 IMPERATIVE REASONS OF OVERRIDING PUBLIC INTEREST (IROPI) & COMPENSATION

J4.2.1 IROPI (Managed Realignment with a Controlled Extent: Adverse Effect Justification)

The least damaging alternative for implementing this plan is likely to cause adverse effect either through freshwater habitat displacement or coastal squeeze. As such, the competent authority need to consider whether the plan is necessary and needs to be implemented for 'IROPI.'

The aim of a Shoreline Management Plan is to 'identify the best approach or approaches to managing risks over the next 100years from flooding and coastal erosion (including cliff instability) both for individual areas and the wider coast.'

In the absence of this plan, these issues would be managed in a less coordinated way that would increase the risk of:

- a. Less sustainable long-term action to manage coastal erosion and flooding in the face of climate change.
- b. Increased risk of flooding and erosion to assets (nationally, regionally and locally important) that would have significant socio-economic impacts
- c. Mismanagement of the coastal environment (including coastal squeeze problems)

The Greater Thames CHaMP has forecast major coastal squeeze problems if these estuaries continue to be managed as they currently are and change in management practices is necessary. The least damaging SMP policies identify the best way of changing management practices over the next 100 years in the least damaging way.

For these reasons the lead authority considers that the Shoreline Management Plan is necessary and has the following 'Imperative Reasons of Overriding Public Importance:'

- A need to address a serious risk to human health and public safety (uncoordinated and uncontrolled flood and erosion risks to large residential populations and major infrastructure);
- Where failure to proceed would have unacceptable social and/or economic consequences (loss of economic infrastructure, commercial property and community areas) through coastal flood and erosion damage;
- Whilst this is a damaging plan, it is the least damaging option for the designated sites in adjusting to the climate change impacts of sea level rise. This SMP therefore has beneficial consequences of primary importance for the environment.

J4.2.2 Compensation

Compensation provisions were developed in partnership with Natural England using the best available information. The partnership agreed that, at SMP level, it was appropriate to

- a. follow DEFRA Policy Guidance on Coastal Squeeze and consider compensatory habitat 'secured' if it is suitably programmed and resourced within the Regional Habitat Creation Programme, and
- b. use the Greater Thames CHaMP predictions of coastal squeeze loss to develop precautionary compensation quotas.
- c. prioritise an action within the SMP Action Plan to investigate appropriate methods of compensating the loss of chalk reef.

Table 12 below summarises the management of coastal squeeze and freshwater habitat compensation within the SMP and the Regional Habitat Creation Programme (RHCP).

Table 12: Isle of Grain to South Foreland SMP Habitat Balance Sheet

Epoch (yrs)	Greater Thames CHaMP Intertidal Losses in SMP Area (Ha)	SMP Intertidal Gains (MR) in Undesignated areas (Ha)	SMP Intertidal Gains (MR) in Designated areas (Ha)	SMP Designated Freshwater Displacement (Ha)	RHCP Intertidal Habitat Compensation for SMP (Ha)	RHCP Freshwater Habitat Compensation for SMP (Ha)
0-20	75	243	123	115	0	115
20-50	330	662	292	408	0	408
50-100	1130	14	295	679	0	679
TOTAL	<u>1535</u>	<u>919</u>	<u>710</u>	<u>679</u>	<u>0</u>	<u>679</u>

NB; Freshwater Displacement & Freshwater Compensation figures are cumulative.

In interpreting the table, the following notes should be considered:

1. The table presents the additional change in habitat in each epoch, cumulative values are only presented in the total.
2. The table presents a range of values as we currently do not know the suitability of the undesignated areas of managed realignment as coastal squeeze intertidal habitat compensation. This may reduce the need for compensation within designated sites and corresponding freshwater habitat displacement.

3. The Greater Thames CHaMP has low confidence in the timing and scale of later coastal squeeze predictions. The SMP recommends a scale of realignment that best benefits estuarine and coastal processes. This is slightly more than the CHaMP prediction. The Medway and Swale Estuary SMP highlighted the possible need for an additional 600Ha of intertidal habitat to compensate for CHaMP predictions. Therefore, in combination with that SMP, the additional intertidal habitat creation opportunities within this SMP could contribute to the additional intertidal requirements needed for the Estuary SMP.

There are areas of undesignated grazing marsh adjacent and inland of the designated sites habitat which, if managed properly, could compensate for the Adverse Effect on Freshwater Habitats arising from this SMP. These areas are summarised in Table 13.

Table 13 Proposed Freshwater Compensation Sites for Habitat Creation Programme

Location	Habitat	Cumulative Habitat Area (Ha)
Rank 1 – South Swale	Grazing Marsh & Standing Water	665
Rank 2 – Possible additional sites within the Thames Estuary to be identified by the TE2100 programme		tbc

Should sufficient areas not be available within these sites, the RHCP will investigate locations increasingly further afield until suitable sites are found.

J5 Limitations and further work

J5.1 CONDITIONS

To best control the conclusion of this HRA and to deliver the least damaging plan, the Natural England / Canterbury City Council partnership have identified the following conditions to be implemented to inform subsequent work:

- a. investigations (ecological survey & monitoring) to increase understanding of the site, its interest features and the conditions necessary to best maintain site integrity;
- b. investigations (geomorphological study) to increase the understanding of sediment flux and habitat change through sea level rise.
- c. prioritise an action within the SMP Action Plan to investigate appropriate methods of compensating the loss of chalk reef.
- d. informed mitigation and;
- e. modification of the realignment extent to best manage the estuary open coast, and cause least adverse effect.

Executing conditions a), b) & c) will enable controls d) & e) to be best informed. Currently there is limited information in these areas on which to base scientific decisions on d) & e).

These conditions shall be executed in partnership between the Environment Agency, Natural England, and Competent Authorities.

J5.1.1 General Obligations to avoid deterioration of European sites.

The official position on the policies affecting this area is as follows;

As shown through the appropriate assessment, the extent of intertidal chalk reef will deteriorate over the duration of the SMP. Although this deterioration is outside of the remit of the SMP, there is an obligation on all Member States to take appropriate steps to avoid, in European sites, the deterioration of natural habitats for which the areas have been designated. This applies in so far as such deterioration could be significant in relation to the objectives of the Directive to ensure 'favourable conservation status' of habitats and species. If influences acting on the site, result in making the conservation status of the habitat less favourable than it was before, then deterioration can be considered to have occurred, contrary to the Directive and its general aims.

Conservation status of a natural habitat is considered favourable on the basis that 1) the natural range and area it covers, is stable or increasing, 2) the specific structure and functions that are the are necessary for its long term maintenance exist, and are likely to continue to exist in the foreseeable future and 3) the conservation status of its typical species is favourable.

All measures taken pursuant to the Directive should be designed to ensure favourable conservation status of natural habitats and species.

J5.2 LIMITATIONS

J5.2.1 Intertidal Habitat Change Predictions

The predictions of estuary and open coast evolution are based on a short dataset of information and have many caveats to their use. The trend of the 2002 North Kent CHaMP shows accretion in both the Medway and the Swale saltmarsh habitats whereas the 2008 Greater Thames CHaMP predicts significant losses. As such confidence in the scale of change is not high. Better monitoring of habitat change, sea level rise and sediment input is required within the sites. An increase in relevant future monitoring has been included in the SMP Action Plan.

J5.2.2 Securing Compensation via Regional Habitat Creation Programme

DEFRA guidance on coastal squeeze guides the use of a Regional Habitat Creation Programme to secure compensatory habitat. This guidance has been followed and it is agreed that habitat is secured. The Southern Region Environment Agency has a programme in development and the information from Stage 4 of this assessment has been integrated into it.

J5.2.3 Status of Adjacent In Combination Studies

Many of the In Combination studies are yet to be completed or to have undertaken Habitats Regulations Assessments or have ephemeral/ intangible recommendations. To appropriately manage in combination effects over time, we shall share this HRA with those teams and monitor the outputs of these projects and the impact on our assumptions.

J5.3 FUTURE WORKS

- a. Undertake all works required to execute the conditions required under Section 5.1 of this assessment.

In executing conditions a), b) & c), involvement, information and support should be sought from relevant partners involved in local ecological management such as the RSPB, Kent Wildlife Trust, British Trust for Ornithology, Kent County Council, Kent Biological Records Centre, Elmley Conservation Trust and Friends of North Kent Marshes (Not an exhaustive list).

The RSPB provided detailed information on each policy unit during consultation that will benefit the start of works.

- b. Establish funding mechanisms for the RHCP to provide precursor compensation to maintain site integrity in advance of coastal defence works.
- c. Share this HRA with professional partners and strategic planners.
- d. Monitor the In Combination Assessments of other strategic plans to ensure that they use this HRA and to reassess the validity of the assumptions of this HRA.
- e. Revisit this HRA at subsequent stages of work (Coastal Flood and Erosion Strategy & Scheme Development) to ensure expansion, reassurance and compliance with this HRA or reassessment.
- f. Work with landowners likely to be affected by Managed Realignment and/ or habitat compensation to enable best adaption to changes over time.

These actions translate into the SMP Action Plan as illustrated in Table 14.

J5.4 CHALK REEF METHODOLOGY

Using the data compiled in D'Olier (2007), the Thanet coastline was split into 21 sections, depending on the actual or potential cliff erosion rates, as the cliffs supply material to the chalk reef. Actual (for undefended sections) and potential (for defended sections) erosion rates were calculated, and the area of cliff lost was calculated for each section over the three epochs defined in the SMP. The exception was the area immediately behind Ramsgate Harbour, as it is assumed that this structure will always be maintained, and therefore obtaining a potential erosion rate would be irrelevant.

Once the erosion areas had been established, it was assumed to be the amount of that may or may not be supplied to the chalk reef depending on the defence policy for each section. The major omission from this methodology is the use of erosion rates for the chalk reef. However, this would require a detailed study, and as such falls outside the remit of the Habitats Regulations Assessment. The author recommends that this be undertaken at a later date to better inform future coastal strategy plans and compensation requirements, and this should be included in the SMP Action Plan.

Table 14 HRA Actions within SMP Action Plan

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 01	Allhallows-on-Sea to Grain (south)	TE2100	Ongoing TE2100 studies should feed into the further studies identified in the Specific Study requirements column for this frontage.	Engage with affected parties to enable adaptation to the change in coastline. Maintain beach Undertake maintenance activities to hold the defence line, to maintain embankments and revetments.	H H L	Undertake study to establish area of acceptable modification of freshwater habitat Monitor beach and water levels as part of strategic regional monitoring programme Survey, record and monitor heritage features in realignment areas.	H H L	Studies will be required to: <ul style="list-style-type: none"> determine the acceptable modification and best management of designated freshwater habitat; investigate the MR policy (best technical, environmental and economic option that best manages flood risk); investigate the impact on ground water level management; investigate the standard of protection, extent and alignment of set-back defences; and, undertake a fuller economic evaluation. 	H M M M	Medway Council, Environment Agency, English Heritage, Natural England

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements		Priority	Actions to be promoted by
4a 02	Garrison Point to Minster	Scoping Review of Cliff Erosion. Isle of Sheppey (2002); Isle of Sheppey Strategy plan 1998;	Review Isle of Sheppey Strategy incorporating both flooding and erosion risks in a single strategy	Maintain beach. (recharge?) Undertake engineering works and maintenance activities to hold the defence line, to maintain seawalls.	H M	Monitor beach and water levels as part of strategic regional monitoring programme Survey, record and monitor heritage features – Sheerness.	H L	n/a	n/a	Swale Borough Council, Environment Agency, English Heritage	
4a 03	Minster Town	Scoping Review of Cliff Erosion. Isle of Sheppey (2002) Isle of Sheppey Strategy plan 1998	Review Isle of Sheppey Strategy incorporating both flooding and erosion risks in a single strategy	Maintain beach and groynes. Undertake engineering works and maintenance activities to hold the defence line, to maintain the seawalls.	H M	Monitor beach and water levels	H	n/a	n/a	Swale Borough Council Environment Agency	

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 04	Minster Slopes to Warden Bay	Scoping Review of Cliff Erosion. Isle of Sheppey (2002)	Review Isle of Sheppey Strategy incorporating both flooding and erosion risks in a single strategy	None		Monitoring shoreline retreat and erosion levels as part of strategic regional monitoring programme, Pro-actively implement exit plan strategy if required. Survey and record heritage features.	H M	<ul style="list-style-type: none"> Develop exit plan for management of shoreline retreat and erosion, and eventual loss of properties. 	H	Swale Borough Council, EA, English Heritage

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 05	Warden Bay to Leysdown-on-Sea	Scoping Review of Cliff Erosion. Isle of Sheppey (2002); Sheppey Strategy plan 1998	Review Isle of Sheppey Strategy incorporating both flooding and erosion risks in a single strategy	Engage with affected parties to enable adaptation to the change in coastline. Maintain beach and groynes at Leysdown-on-Sea. Undertake engineering works and maintenance activities to hold the defence, to maintain seawalls and revetments along localised sections. Construct set-back defences where MR (dependant on the outcomes of further studies regarding MR and realignment positions)	H H M M	Monitoring shoreline retreat and erosion levels as part of strategic regional monitoring programme Pro-actively implement exit plan strategy if required. Survey and record heritage features in realignment area. Monitor Leysdown beach and water levels. Monitor habitat changes in MR area.	H H H M	Studies will be required to: <ul style="list-style-type: none"> investigate the MR policy at The Bay (best technical, environmental and economic option that best manages flood risk); investigate the standard of protection, extent and alignment of set-back defences; undertake a fuller economic evaluation; and, develop an exit strategy for removal of caravan park. 	H H H H	Swale Borough Council EA, English Heritage

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 06	Leysdown-on-Sea to Shell Ness	Isle of Sheppey Strategy plan (1998)	Review Isle of Sheppey Strategy incorporating both flooding and erosion risks in a single strategy	Engage with affected parties to enable adaptation to the change in coastline. Construct set-back defences (dependant on the outcomes of further studies regarding MR and realignment positions).	H M	Undertake study to establish area of acceptable modification of freshwater habitat Monitor Leysdown beach and water levels. Survey, record and monitor unknown buried heritage features in realignment area. Monitor habitat changes in MR area.	H H M M	Studies will be required to: <ul style="list-style-type: none"> investigate the MR policy (best technical, environmental and economic option that best manages flood risk); investigate the standard of protection, extent and alignment of set-back defences; investigate the impact on ground water level management; determine the acceptable modification and best management of designated freshwater habitat; undertake a fuller economic evaluation; and, Develop an exit plan for the safe relocation of people and removal of properties at Shell Ness. 	H H H H H	Swale Borough Council, EA, English Heritage, Natural England

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 07A	Faversham Creek to the Sportsman Pub	Faversham Creek to Whitstable Harbour Strategy 2004	To review frontage in light of change to medium / long term policy	Engage with affected parties to enable adaptation to the change in coastline. Option to construct set-back defences in the first epoch (dependant on the outcomes of further studies regarding MR and realignment positions). Undertake maintenance activities to hold the line, to maintain the seawall.	H M L	Survey footprint of set-back defence and foreshore. Survey, record and monitor in proposed realignment area Undertake study to establish area of acceptable modification of freshwater habitat Monitor beach and water levels as part of the strategic regional monitoring programme	H H H H H	Studies will be required to investigate: <ul style="list-style-type: none"> the MR policy (best technical, environmental and economic option that best manages flood risk); the option to realign in the first epoch should the need for habitat creation in the first epoch arise; the standard of protection, extent and alignment of set-back defences; compliance with SEA Directive 2001/42 EC; the impact on ground water level management; and, determine the acceptable modification and best management of designated habitat. 	H H H H H	CCC, EA, Swale Borough Council, English Heritage, Kent County Council - (funding for foreshore survey), Natural England

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 07B	Sportsman Pub to Seasalter	Faversham Creek to Whitstable Harbour Strategy 2004	To review frontage in light of change to long term policy	Engage with affected parties to enable adaptation to the change in coastline. Specifically to maintain beach and groynes in line with Strategy Plan. Undertake engineering works and maintenance activities to hold the defence line, to maintain embankment.	H H L	Monitor beach and water levels	H	<ul style="list-style-type: none"> Studies to quantify the social impacts of community at Faversham Road with realignment identified in the 3rd epoch (include as part of the strategy review) 	M	Canterbury City Council, Ea. English Heritage, Kent County Council - (funding for foreshore survey)
4a 08	Seasalter to Whitstable Town (Golf Course)	Faversham Creek to Whitstable Harbour Strategy 2004	n/a	Maintain beach and groynes. Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall.	H L	Monitor beach and water levels as part of the strategic regional monitoring programme	H	n/a	n/a	Canterbury City Council Environment Agency

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements		Priority	Actions to be promoted by
4a 09	Whitstable Town (Golf Course) to Whitstable Harbour	Faversham Creek to Whitstable Harbour Strategy 2004		Maintain beach and groynes. Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall.	H L	Monitor beach and water levels as part of the strategic regional monitoring programme	H	n/a	n/a		Canterbury City Council Environment Agency
4a 10	Whitstable Harbour (east) to Swalecliffe	Tankerton Coastal strategy 1996	Review ahead of next major recharge	Maintain beach with recharge and maintain / upgrade groynes. Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall	H L	Monitor beach and water levels as part of the strategic regional monitoring programme	H	n/a	n/a		Canterbury City Council Environment Agency

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 11	Swalecliffe to Herne Bay Breakwater	Swalecliffe Coastal Strategy	Due to commence in 2008	Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall and revetment. Maintain beach and groynes.	H H	Monitor beach and water levels as part of the strategic regional monitoring programme	H	<ul style="list-style-type: none"> Strategy study will include a fuller economic evaluation. 	H	Canterbury City Council Environment Agency
4a 12	Herne Bay Breakwater to Bishopstone Manor	Herne Bay Coastal Strategy	To commence in 2008/09	Maintain beach and groynes. Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall.	H M	Monitor beach and water levels as part of the strategic regional monitoring programme	H	n/a	n/a	Canterbury City Council Environment Agency
4a 13	Reculver Country Park	Herne Bay Coastal Strategy	To commence in 2008/09	None		Monitor shoreline retreat and erosion and survey, record and monitor heritage features.	H	<ul style="list-style-type: none"> Develop plan for management of shoreline retreat and erosion, relocation of paths etc. 	H	CCC; EA

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 14	Reculver Towers to Minnis Bay	Reculver to Minnis Bay Coastal Strategy 1998	To review frontage	Engage with affected parties to enable adaptation to the change in coastline. Maintain beach with recharge. Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall and rock groynes.	H H L	Monitor beach and water levels as part of the strategic regional monitoring programme Survey, record and monitor heritage features in realignment area.	H L	Strategy review study will be required to: <ul style="list-style-type: none"> investigate the MR policy (best technical, environmental and economic option that best manages flood risk); investigate the standard of protection, extent and alignment of set-back defences; investigate habitat creation potential; investigate the impact on adjacent coastlines and land; undertake a new economic evaluation; Particular note needs to be taken of the poor quality ground for foundation works of a new defence line and the potential impact of creating a sediment sink on the adjacent units; and, Investigate impact on “fresh water” water in adjacent farmland 	H H H H H	Canterbury City Council, Thanet District Council Environment Agency

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 15	Minnis Bay to Westgate-on-Sea	None	Required to establish areas where maintenance / improvement works are required and areas where defences may cease to be maintained in the future.	Engage with affected parties to enable adaptation to the change in coastline. Undertake engineering works and maintenance activities to hold the defence line where HTL policy, to maintain the sea walls, none where NAI policy.	H M	Monitor shoreline retreat and erosion where NAI as part of the strategic regional monitoring programme Survey and record heritage features.	M M	n/a	n/a	Thanet District Council Environment Agency
4a 16	Margate	None	maintenance / improvement works are required and areas where defences may ceased to be maintained in the	Maintain beaches. Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall.	H L	Monitor beach and water levels as part of the strategic regional monitoring programme	H	n/a	n/a	Thanet District Council Environment Agency

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4a 17	Cliftonville	None	Required to establish areas where maintenance / improvement works are required and areas where defences may ceased to be maintained in the future May be achieved	Engage with affected parties to enable adaptation to the change in coastline. Maintain beaches. Undertake engineering works and maintenance activities to hold the defence line where HTL policy, to maintain the sea walls, none where NAI policy.	H H L	Monitor shoreline retreat and erosion where NAI. Monitor beach and water levels. as part of the strategic regional monitoring programme Survey and record heritage features.	H M	n/a	n/a	Thanet District Council Environment Agency

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4b 18	White Ness to Ramsgate	None	Required to establish areas where maintenance / improvement works are required and areas where defences may ceased to be maintained in the future	Engage with affected parties to enable adaptation to the change in coastline. Maintain beaches Undertake engineering works and maintenance activities to hold the defence line where HTL policy, to maintain the sea walls, none where NAI policy.	H H L	Monitor shoreline retreat and erosion where NAI Monitor beach and water levels as part of the strategic regional monitoring programme Survey and record heritage features.	M H	n/a	n/a	Thanet District Council Environment Agency
4b 19	Ramsgate Harbour	None	required and areas where defences	Undertake engineering works and maintenance activities to hold the defence line, to maintain the harbour arms.	L			n/a	n/a	Thanet District

Policy Unit	Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
**4b 20	*Ramsgate Harbour (west) to north of the River Stour	South of unit - Sandwich Bay Coastal Strategy - Pegwell Bay to Kingsdown (River Stour CFMP)	improvement works are required and areas where defences may ceased to be maintained in the future May be achieved by coastal risk assessment. Engage with affected parties to enable adaptation to the change in coastline. Undertake engineering works and maintenance activities to hold the defence line where HTL policy, to maintain the sea walls, revetments and groynes, none where NAI policy.	H L	Monitor shoreline retreat and erosion where NAI. as part of the strategic regional monitoring programme Survey and record heritage features.	M M	n/a	n/a	Thanet District Council Environment Agency
**4b 21	*South of the River Stour to Sandwich Bay Estate (north)	Sandwich Bay Coastal Strategy - Pegwell Bay to Kingsdown (River Stour CFMP)	Strategy ongoing		Monitor shoreline retreat. Monitor beach and water levels as part of the strategic regional monitoring programme Survey record and monitor heritage features.	H H M	Studies will be required to investigate mitigation measures for loss of designated habitat.	H	Dover District Council Environment Agency

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements		Priority	Actions to be promoted by
**4b 22	Sandwich Bay Estate (north) to Sandown Castle (remains of)	Sandwich Bay Coastal Strategy - Pegwell Bay to Kingsdown	Strategy ongoing	Maintain beach. Undertake engineering works and maintenance activities to hold the defence line, to maintain revetments and embankments.	H L	Monitor beach and water levels as part of the strategic regional monitoring programme	H	n/a	n/a	Dover District Council Environment Agency	
**4b 23	Sandown Castle (remains of) to Oldstairs Bay	Deal to Kingsdown Coastal strategy 2001		Maintain beach and groynes. Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall.	H L	Monitor beach and water levels as part of the strategic regional monitoring programme Survey record and monitor Scheduled Monuments.	H M	n/a	n/a	Dover District Council Environment Agency	
**4b 24	Oldstairs Bay to St Margaret's Bay					Monitor shoreline retreat and erosion. as part of the strategic regional monitoring programme	M	n/a	n/a	Dover District Council	

Policy Unit		Coast Defence Strategy	Strategy Review Required?	Engineering and Maintenance Works and Adaptation for Short Term Policy	Priority	Specific Monitoring Requirements	Priority	Specific Study Requirements	Priority	Actions to be promoted by
4b 25	St Margaret's Bay			Maintain beach and groynes. Undertake engineering works and maintenance activities to hold the defence line, to maintain the sea wall.	H L	Monitor beach and water levels as part of the strategic regional monitoring programme	H	n/a	n/a	Dover District Council Environment Agency
4b 26	South Foreland					Monitor shoreline retreat and erosion as part of the strategic regional monitoring programme	M	n/a	n/a	Dover District Council

* The Isle of Grain to South Foreland SMP abuts the River Stour Catchment Flood Management Plan (CFMP) at the River Stour estuary mouth near Sandwich. The River Stour CFMP covers the Stour catchment from the source down to its estuary mouth.

** The Isle of Grain to South Foreland SMP overlaps with the Pegwell Bay to Kingsdown Coastal Management Strategy along these units. The Pegwell to Kingsdown Strategy builds upon the policies of the River Stour Catchment Flood Management Plan for the tidal River Stour and the policies of the Isle of Grain to South Foreland Shoreline Management Plan review for the coastline between Pegwell to Kingsdown .

References

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4. North Kent CHaMP (English Nature, 2002)
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7. Environment Agency Habitats Directive Handbook
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10. River Tyne to Flamborough Head Habitats Regulations Assessment
12. European Site Citations & Regulation 33 Packages
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14. Southern Region Regional Habitat Creation Programme (Environment Agency, 2008)
14. Erosion Rate Study – Isle of Thanet Coastline (D'Olier, 2007)
15. Faversham Creek to Whitstable Harbour Coastal Defence Strategy Plan (2004)
16. Pegwell Bay to Kingsdown Cliffs Coastal Strategy Plan (2000)
17. Isle of Sheppey Strategy Plan (1998)
18. Tankerton Coastal Strategy (1996, 2004)
19. Reculver to Minnis Bay Coastal Strategy (1998)
20. Faversham Road Coastal Strategy (2008)
21. Swalecliffe Coastal Strategy (in preparation)
22. Herne Bay Coastal Strategy (post-Swalecliffe strategy)

**APPENDIX A: HABITATS REGULATIONS ASSESSMENT
METHOD**

Final Habitats Regulations Assessment Guidance for the Medway & Swale SMP

Contents

- 1 Introduction
- 2 Flow Chart of Method
- 3 Stage 2 – Generic Policy Assessment of Significant Effect
- 4 Stage 3 – Assessment of Effects
- 5 Stage 4 - Next Steps
- 6 Glossary

1.0 Introduction

This method describes a proposal, as developed by Mark Smith of Southern Region NCPMS, for undertaking an Habitats Regulations Assessment of the effect of a Shoreline Management Plan (SMP) on Natura 2000 sites as now required by the Environment Agency and its partners in approving such plans. The method has been developed in advance of the production of National Guidance to enable the assessment of the Medway & Swale SMP in North Kent and avoid significant programme effect.

1.1 Background

SMPs are policy setting documents that determine one of four ways of managing the shoreline and its coastal defences over the next 100 years; Hold the Line, Advance the Line, Managed Realignment or No Active Intervention. There are two subsequent appraisal stages before any intervention can be taken on the shoreline, Coastal Defence Strategy and Scheme Development. The strategy level appraises the options for implementing the SMP Policy for sections of shoreline e.g. brick wall or sheet piles. At scheme stage the detailed design and third party (Statutory) approvals are determined. Dependant on the level of variation from the assessed and approved SMP, each of these stages will require Habitats Regulations Assessment.

The Environment Agency deemed this a requirement in the 2006/07 financial year, coinciding with significant cuts within their available budgets.

1.2 Reliances/Limitations of method

It is worth stating the following at the outset:

- a) The method has been derived to reflect what is considered to be an 'Appropriate' level of assessment at Policy setting stage. Further detail may be required as advised by Natural England.

- b) The method is systematic and sequential to make it practical and auditable but may be exclusive. Examples are provided to assist interpretation.
- c) The method has been developed so that it can be achievable within the 06/07 financial constraints whilst delivering a responsible assessment.
- d) The method will rely on the understanding of Coastal/ Estuary processes developed to inform the SMP to assess the affect of these processes on the Natura 2000 sites e.g. Quantify Coastal Squeeze Effects & Define the most sustainable long term coastal/ estuary alignment. Natural England will agree the level of detail at Stage 1 of the assessment.
- e) The method should assist subsequent appraisal stages.
- f) The SMP sets policy not the scale of the policy nor how the policy will be implemented. To progress, some hazards to the site will not be assessed at this level unless they would preclude implementation of the SMP policy, i.e. if it is possible to implement the policy without causing the hazard then the detailed assessment is required at more detailed stages. Natural England will agree the level of detail of the SMP assessments prior to commencement.
- g) A level of detail of impacts on species needs to be agreed with Natural England. Considering the nature of the plans being assessed, we recommend that detailed species assessments are made at subsequent more detailed appraisal stages.

To meet these requirements, the method is fundamentally reliant on agreement between the Lead Maritime Authority (Environment Agency in MESFRMP) and Natural England on the 'Appropriate' level for a policy setting document at Stage 1 of the Habitats Regulations Assessment. This method requires agreement of the following:

1. Natural England and the lead Authority (and others) to agree the designated features/ level of assessment of impacts on designated features at this policy setting level. All parties should agree to the level of assessment at Shoreline Management Plan (Policy Setting) stage e.g. if the habitat network is maintained and the site managed in favourable condition, then some/ all reliant designated species are provided for.
2. Natural England work as a partner in actively providing the best available information on the site (e.g. habitat maps behind the site designations, conservation objectives) and to agree that the information they hold is an acceptable level of information on which to make the habitat assessments.
3. Natural England and the Lead Authority to agree all the sufficiency of methods proposed (e.g. quantification of habitat change) prior to the assessment.
4. Natural England considers and provides detail to inform viable site modification.

1.3 Method

The flowchart overleaf illustrates the process of undertaking the assessment. Stage 1 is straightforward and current methodologies should be followed. Stages 2, 3 & 4 (Next Steps) are

discussed in detail in the following section of the document. The method for establishing the effect of the SMP policies upon the chalk reef in Policy Units 4a15 - 4a20 was different to the established method, and as such is detailed overleaf.

2.0 Flowchart of SMP Habitats Regulations Assessment Process

Stage 1	Clarify whether Plan is 'Necessary' for the site management	<ul style="list-style-type: none"> Query Natural England Representative
	Set out responsibilities Agree Limits/ Info for Assessment & Obtain Site Information	<ul style="list-style-type: none"> Competent Authority (EA, Coastal Authority), Site Administrator (NE), DEFRA & Secretary of State Lead Authority & Natural England Citation – Current version from JNCC website Conservation Objectives – Natural England Reg 33 Package (Where they exist) – Natural England Stages 1&2 of EA Review of Consents
Stage 2	Assessment of Policies for 'Likely Significant Effect'	<ul style="list-style-type: none"> Test each of the 4 SMP Policies to see if they would cause likely significant effect on the site Apply these generic assessments to the units to screen out/ include units for Stage 3. Complete Appendix 11 & send to NE
Stage 3	Assessment of Units & Overall Strategy	<ul style="list-style-type: none"> Apply the generic assessment from Task 3 to each policy unit and the associated final policy. Assess the overall net of adverse effect against gains from all the policy units to determine SMP wide effect. Assess in combination effects/ mitigation measures Assess alternative policies & conditions as required
	Agree Habitats Regulations Assessment	<ul style="list-style-type: none"> Complete Appendix 12 for whole plan Discuss, refine and seek sign off from Natural England. If Adverse Effect & Compensation required move to next steps
Stage 4	IROPI Test/ Identify & Secure Compensation Measures	<ul style="list-style-type: none"> Revisit alternatives tests Test Overriding Public Interest Identify & Secure/ Programme compensation measures with NE advice
	Seek Ratification of the Assessment & Compensation	<ul style="list-style-type: none"> Discuss, refine and seek sign off from Natural England Send to DEFRA/ Secretary of State as required.

2.1 Chalk reef methodology

Using the data compiled in D'Olier (2007), the Thanet coastline was split into 21 sections, depending on the actual or potential cliff erosion rates, as the cliffs supply material to the chalk reef. Actual (for undefended sections) and potential (for defended sections) erosion rates were calculated, and the area of cliff lost was calculated for each section over the three epochs defined in the SMP. The exception was the area immediately behind Ramsgate Harbour, as it is assumed that this structure will always be maintained, and therefore obtaining a potential erosion rate would be irrelevant.

Once the erosion areas had been established, it was assumed to be the amount of that may or may not be supplied to the chalk reef depending on the defence policy for each section. The major omission from this methodology is the use of erosion rates for the chalk reef. However, this would require a detailed study, and as such falls outside the remit of the Habitats Regulations Assessment. The author recommends that this be undertaken at a later date to better inform future coastal strategy plans and compensation requirements.

3.0 Stage 2 Guidance - Assessment of Generic policy options for 'Likely Significant Effect'

3.1 TEMPORARY EFFECTS – For all sites

At SMP level, investigate and record any controls required over timing of work (programme work outside bird nesting season/ migration period) or work adjacent to site (set working area to remove/ minimise effect). List the potential temporary impacts that have been identified and the mitigating controls that would enable a conclusion of no adverse effect. Include these impacts and mitigating conditions into the final assessment. Highlight that any variation from these conditions will require detailed assessment and/or control of these impacts at scheme stage will be required before issue of land drainage consent & planning approval.

3.2 PERMANENT EFFECTS

To assess the likely significant permanent effect of the SMP Policies, the generic assessments in Table 1 are sequentially tested against each policy unit for each Natura 2000 site (see Table 2, Task A for example). This will enable neutral (no) effect policy units to be screened out of future assessments. Policy units with likely significant beneficial or negative effects will be recorded on an Appendix 11 form for each Natura 2000 site.

The Stage 3 Action column is included to guide the reader on how the Stage 2 assessment moves into Stage 3.

Please note that the scenarios for intertidal habitats will have been sufficiently established within the coastal & estuarine processes investigations (desk study and research) undertaken during SMP development. Please see glossary to expand abbreviations.

Table 1 –Stage 2 Assessment Of Permanent Effect Of Generic Policies Under Typical Site Scenarios

HABITAT	TYPICAL SCENARIO	POLICY	STAGE 2 ASSESSMENT	STAGE 3 ACTION
A - INTERTIDAL	1. Intertidal habitat accreting – accretion rate is greater than or equal to sea level rise for 100 yrs	1 - HTL	No significant effect as no habitat is lost	Quantify gain/ balance
		2 - ATL	Significant effect due to footprint of habitat lost	Quantify losses
		3 - MR	Beneficial effect as more habitat is created (Note 1)	Quantify gains
		4 - NAI	Beneficial effect as more habitat is created (Note 1)	Quantify gains
	2. Intertidal habitat accreting – accretion rate is less than sea level rise i.e. SLR to overtake accretion rate in year X	1 - HTL	No significant effect until year X by which time there will be a significant effect	Quantify year X Quantify losses from year X
		2 - ATL	Significant effect due to footprint of habitat lost then in year X further significant effect	Quantify year X Quantify direct footprint losses+ losses from year X
		3 - MR	Beneficial effect as more habitat is created (Note 1)	Quantify gains
		4 - NAI	Beneficial effect as more habitat is created (Note 1)	Quantify gains
	3. Intertidal habitat eroding / subject to sea level rise	1 - HTL	Significant effect	Quantify losses
		2 - ATL	Significant effect	Quantify all losses
		3 - MR	Beneficial effect as more habitat is created (Note 1)	Quantify gains
		4 - NAI	Beneficial effect as more habitat is created (Note 1)	Quantify gains

HABITAT	TYPICAL SCENARIO	POLICY	STAGE 2 ASSESSMENT	STAGE 3 ACTION
B – Freshwater / Terrestrial (Cliffs)	1. Freshwater/ Terrestrial habitat in coastal floodplain/ on and behind cliffs protected from damage by current coastal or estuarine defences	1 - HTL	No significant effect	None
		2 - ATL	Beneficial effect if habitat created otherwise no significant effect	Quantify any gains
		3 - MR	Significant effect unless – See Note 2	See Note 2
		4 - NAI	Significant effect unless – See Note 2	See Note 2
C –ERODING CLIFFS	1. Eroding Cliffs where erosion is a) Controlled & b) Uncontrolled	1 - HTL	Significant Effect	Quantify Losses
		2 - ATL	Significant Effect	Quantify Losses
		3 - MR	a) Potential no effect or beneficial effect b) Significant Effect	a) Quantify Habitat Balance b) Quantify Losses
		4 - NAI	No Significant Effect	None

Table 1 – Notes

1. This policy scenario may not benefit features outside the immediate coastal zone e.g. Islands. The location of such features should be considered in more detail in the assessment.

2. Where there is a Managed Realignment or No Active Intervention Policy proposed that will effect a Natura 2000 freshwater site the assessment is as follows, significant effect unless:

a) It is in the wider interest of the whole site (SPA, SAC, Ramsar) to increase the proportion of intertidal habitat by modifying the site (subject to Natural England consultation)

b) Through whole site/ in combination assessment, it can be demonstrated that adequate freshwater habitat is being secured in the SMP (from Advance the Line policies) or bounding CFMPs to mitigate for changes **(EA & NE to confirm whether this position is formal)**.

4.0 Stage 3 Guidance – Assessment of Effects

Each unit is assessed action by action as detailed in Table 2 below:

Table 2 – Stage 3 Adverse Effect Assessment Procedure

Task No.	Task	Example
A	<p>For each policy unit that poses a ‘likely significant effect’ (Stage 2), the magnitude of habitat change is quantified (see guidance Table 1)</p>	<p>Example 1: An intertidal site is accreting at a rate greater than the effects of coastal squeeze and a Hold the Line policy is proposed for policy unit 13. The sequential test for the unit is as follows:</p> <p>Stage 2 Sequential Test Habitat : Intertidal = A Scenario: Intertidal accreting > SLR = 1 Policy: Hold the Line (HTL) = 1 Assessment: Significant Beneficial Effect as habitat is created, record in Appendix 11</p> <p>Stage 3, Task A Action: Quantify the gains in intertidal habitat (area of accretion – SLR losses). For example, the predicted accretion will generate 20 Ha of habitat whereas SLR will inundate 15Ha > 20-15 = 5 Ha gain in intertidal habitat for this policy unit. Quantify the gains per habitat type > +2Ha Saltmarsh, +3Ha Mudflat</p> <p>Policy unit 13 assessment = Significant Beneficial effect with 5Ha habitat gain (+2Ha Saltmarsh, +3Ha Mudflat)</p>
B	<p>The epoch of the policy and the effect is assessed</p>	<p>Example 2: Policy Unit 7 has a Hold the Line policy for the first 2 epochs (0-20, 20-50yrs) and a Managed Realignment policy for the 3rd epoch 50-100yrs. The policy unit bounds an intertidal site that is subject to coastal squeeze. The sequential test from Task A has determined:</p> <p>a) Significant Negative Effect of 0.1Ha/yr habitat loss for the policy unit for the Hold the Line epochs, and b) Significant Beneficial effect for the Managed Realignment in the 3rd epoch as 30Ha of intertidal habitat is created</p> <p>Task B assessment of Policy Unit 7 is as follows: Epoch 1 (0-20yr): Significant Negative effect with 2Ha habitat loss (all Saltmarsh) Epoch 2 (20-50yr): Significant Negative effect with 3Ha habitat loss (2Ha Saltmarsh, 1 Ha Mudflat)</p>

Task No.	Task	Example
		<p>Epoch 3 (50-100yr): Significant Beneficial Effect of 30Ha of habitat creation (10 Ha Saltmarsh, 20Ha Mudflat)</p> <p>Policy Unit Assessment = Negative Effect for Epochs 1 & 2 (5 Ha), Beneficial Effect for Epoch 3 (30 Ha)</p>
C	<p>Across the whole Natura 2000 site for each designated habitat type, the habitat lost and habitat gained are quantified for each epoch for the life of the plan (100 years). The net effect/ epoch and the net effect of the life of the plan are calculated to determine whether the plan, as a whole, results in a loss or gain in said designated habitat.</p>	<p>Example 3: The South Downs SMP has 15 Policy Units affecting a Coastal SPA. For the whole plan, tasks 1 & 2 determined the following for Saltmarsh:</p> <p>Epoch 1 (0-20 yr): 10 units significant effect (-50 Ha); 5 units beneficial effect (+5 Ha) = Significant (45Ha)</p> <p>Epoch 2 (20-50 yr): 8 units significant effect (-50 Ha); 7 units beneficial effect (+25 Ha) = Significant (-25Ha)</p> <p>Epoch 3 (50-100 yr): 4 units significant effect (-10 Ha); 11 units beneficial effect (+100 Ha) = Beneficial (90Ha)</p> <p>Whole Plan Life = Significant Beneficial Effect on SPA (30Ha)</p> <p>Epochs 1 & 2 = Significant Temporary Negative Effect, Assess effect on site integrity, considering habitat recreatability,</p>
D	<p>Across the whole Natura 2000 site, the units are assessed for gains and losses to determine whether the habitats supporting the site are maintained, improved or reduced by the SMP as a whole. The net effect/ epoch and the net effect of the life of the plan are calculated to determine whether the plan, as a whole, has an adverse effect. The conclusion is then tested in combination with other plans as per task E</p>	<p>Example 4: The North Norfolk SMP has 15 Policy Units affecting a Coastal SPA. For the whole plan, tasks 1, 2 & 3 determined the following:</p> <p>Epoch 1 (0-20 yr): Shingle (-5Ha), Saltmarsh (-20Ha), Mudflat (0Ha), Grazing Marsh (0Ha)</p> <p>Epoch 2 (20-50 yr): Shingle (-7Ha), Saltmarsh (-15Ha), Mudflat (-20Ha), Grazing Marsh (-5Ha)</p> <p>Epoch 3 (50-100 yr): Shingle (+15Ha), Saltmarsh (+40Ha), Mudflat (+30Ha), Grazing Marsh (-5Ha)</p> <p>Whole Plan Life > Shingle (+3Ha), Saltmarsh (+10Ha), Mudflat (+10Ha), Grazing Marsh (-10Ha)</p> <p>Conclusion of Task D</p> <p>Epoch 1 = Adverse effect for Shingle & Saltmarsh</p> <p>Epoch 2 = Adverse effect for Shingle, Saltmarsh, Mudflat & Grazing Marsh</p> <p>Epoch 3 = Beneficial effect for Shingle, Saltmarsh & Mudflat but Adverse effect for Grazing Marsh</p> <p>Whole Plan: Beneficial effect for the intertidal habitat but an Adverse effect of 10Ha Grazing Marsh loss</p>

Task No.	Task	Example
		<p>Action Shingle, Saltmarsh & Mudflat: The temporary effect of habitat loss should be tested with Natural England to assess their sensitivity in maintaining the Natura 2000 site. If temporary losses would cause unrecoverable losses then policies should be revisited or tested in combination (Task E) with other plans/ initiatives that may create equivalent adjacent habitat. If no opportunity present then move to Stage 4.</p> <p>Grazing Marsh: SMP Policies should be revisited (particularly in the 1st epoch) to look for opportunities for Grazing Marsh creation or undertake in combination assessment (Task E) with CFMP to integrate any CFMP Grazing Marsh creation. If no opportunity present then move to Stage 4.</p>
E	<p>The findings of Task D are then tested in combination with other plans in the area to assess cross plan impacts / opportunities.</p> <p>Should this conclude no adverse effect, complete Appendix 12 & move to Task G.</p> <p>Should it be determined that the plan, as a whole or in combination, has an Adverse effect, move to Task F</p>	<p>Example 5: Shoreline Management Plan A determines a net loss of 15 Ha of mudflat in an intertidal site over a 100 year life whereas adjacent SMP B determines 40 Ha of mudflat gain on the same site. Therefore, in combination there is no adverse effect from the Plans.</p> <p>Example 6: SMP A determines a net loss of 20 Ha of freshwater habitat in Epoch2 whereas an adjacent Catchment Flood Management Plan determines a net gain of 22 Ha of freshwater habitat improvement adjacent to said site in Epoch 1. If Natural England and others agree to extend the site boundary in Epoch 1 following the CFMP action, in combination there is no adverse effect.</p> <p>Example 7: An SMP determines that there will be a loss of habitat although partner authorities have agreed no adverse effect as an action plan that mitigates the loss has been developed to the satisfaction of all. However, the in combination assessment highlights that an adjacent local development framework is promoting a housing development on land highlighted or allocated in the action plan for mitigation.</p> <p>Partner authorities, including NE, meet with Local Authority to revise Local Development Framework, object to LDF or seek alternative mitigation areas to address the issue and satisfy that the SMP has no adverse effect. If no resolution is found then the Action plan is invalid for this mitigation & requires rework.</p>
F	<p>The policies and units are revisited and mitigation conditions or alternatives policies are assessed.</p>	<p>Example 8: The assessment highlights that the most sustainable (estuary/ coastal process, economically viable, objectives met) alignment of a Managed Realignment policy will flood a non-recreatable, priority Natura 2000 freshwater habitat with tidal water causing adverse effect. As a mitigation measure, the boundary of the priority freshwater Natura 2000 feature is used to define the</p>

Task No.	Task	Example
	<p>Should this iterative process conclude no adverse effect, complete Appendix 12 Form and progress SMP</p> <p>Should this iterative process continue to show Adverse Effect or it is clear that Adverse Effect cannot be avoided then move to Stage 4</p>	<p>alignment of Managed Realignment, protecting the feature for the period of time Natural England advise is required.</p> <p>Example 9: Within Epoch 1&2 of the plan, the SMP Preferred Policy of Hold the Line causes coastal squeeze losses. The Natura 2000 site doesn't extend landward of the defence and there is sufficient available defended land to allow for coastal habitat migration inland. The assessment of Policy Scenario Assessment derived Managed Realignment as the policy that met the next highest number of objectives. An alternative policy of Managed Realignment is chosen to enable a controlled change in the defence alignment and maintain site integrity whilst meeting as many objectives as possible. The policy choice is justified by the Habitats Regulations Assessment findings and legal obligation to maintain site integrity.</p>
G	<p>Once the plan has been refined and the Habitats Regulations Assessment determined that the plan is acceptable, all required works, policy unit linkages and other plan linkages must be clarified within the supporting text behind each unit in the SMP to make it clear for future workers.</p>	<p>Example 10: Within Epoch 1&2 of the plan, all Coastal squeeze losses are mitigated for by managed realignments in policy units 8 & 11. Unit 8 & 11 must be protected against policy change/ programme change/ change in Managed Realignment size for the Habitats Regulations Assessment to be valid.</p> <p>Example 11: A Managed Realignment over a freshwater site requires prior habitat creation to be delivered by the Catchment Flood Management Plan. The details of the CFMP, the responsible party & the programme for implementation of the CFMP policy must be clearly included in the SMP. It must be made clear that the works have to be undertaken in accordance with the CFMP for the Habitats Regulations Assessment to be valid.</p>
H	<p>The sensitivities/ mitigating conditions of the Habitats Regulations Assessment are recorded in the SMP for clear future reference.</p>	<p>Example 12: Mudflat & Saltmarsh growth within Policy Units 9, 10 & 14 of the plan is so significant that it outweighs the coastal squeeze losses against these habitats for the rest of the plan's units. The trend of growth in these areas must be allowed, monitored & the areas protected for the plan to have no adverse effect and the site to be maintained in favourable condition.</p>

5.0 Next Steps

Should the Habitats Regulations Assessment continue to determine Adverse Affect following the guidance in Stage 4, then the Imperative Reasons for Overriding Public Interest (IROPI) tests must be applied in line with DEFRA's Guidance on Coastal Squeeze (see DEFRA Flood & Coastal Defence Website) or reference below if current. For an SMP, DEFRA acknowledge that the typical IROPI case will be management of the international environmental features.

Compensatory habitat will be quantified by the lead Authority, with early advice from Natural England. This will be secured via a Regional Habitat Creation Programme.

The Lead Authority and Natural England will develop a joint case to accompany the Habitats Regulations Assessment for submission to the Secretary of State with the knowledge that, if implemented, the plan would adversely effect Natura 2000 site integrity.

5.1 Imperative Reasons for Overriding Public Interest (IROPI)

Up to date information on these can be found at www.DEFRA.gov.uk/wildlifecountryside/ewd/ewd09.htm

At the time of drafting, these reasons were listed as follows:

- A need to address a serious risk to human health and public safety;
- The interests of national security and defence;
- The provision of a clear and demonstrable direct environmental benefit on a national or international scale;
- A vital contribution to strategic economic development or regeneration;
- Where failure to proceed would have unacceptable social and/or economic consequences.

The relative importance of the SPA or SAC within the European network will also weigh in the balance of considerations. Some sites are designated for habitat types and species that are listed as priority under the Habitats Directive. These must be subject to particularly stringent scrutiny. In these cases the Directive requires considerations other than human health and public safety or overriding environmental reasons to be subject to an opinion from the European Commission. In all cases, this assessment should include close liaison with Natural England such that all parties are aware of and agree the constraints that drive such a grave conclusion.

6.0 Glossary

Acronym	Full Title	Meaning
ATL	Advance the Line	The construction of a new flood management scheme in front of existing flood defences.
CHaMP	Coastal Habitat Management Plan	A document prepared to ensure compliance of future SMP's and Flood Management Strategies with the Habitats and Birds Directives.
SAC	Special Area of Conservation	An internationally important habitat or species designated under the EC Habitats Directive.
EA	Environment Agency	The leading public body for protecting and improving the environment in England and Wales.
E1/2/3	Epoch 1/2/3	A period of time.
Ha	Hectares	10000 square metres
HTL	Hold the Line	Maintaining the existing flood defences and control structures in their present positions and increase the standard of protection against flooding in some areas
IROPI	Imperative Reasons of Overriding Public Interest	Reasons where the interests of a Natura 2000 site are overridden by other concerns – listed on DEFRA Website.
MR	Managed Realignment	The policy of Managed Realignment involves the placement of a new Managed Realignment flood defence landward of the existing flood defences or realignment to higher ground.
	Natura 2000	A term used to commonly refer to SPAs, SACs & Ramsar Sites.
NAI	No Active Intervention	There would be no further active intervention by Authorities. Without intervention the defences would eventually fail and areas currently protected from flooding would no longer be protected.
NE	Natural England	Nature Conservation Body for England
NCPMS	National Capital Programme Management Service	Environment Agency Department
Ramsar	Ramsar Site	Wetlands designated under the Ramsar Convention, due to their importance, especially as waterfowl habitat.

Acronym	Full Title	Meaning
SLR	Sea Level Rise	The rise of sea levels in relation to land levels throughout time in response to global climate and local tectonic changes.
SMP	Shoreline Management Plan	A national initiative for the future planning of the coastline taking a holistic approach to include all coastal authorities. The document brings together information pertaining to coastal issues such as flooding, erosion, coastal process and human and environmental needs.
SPA	Special Protection Area	Internationally important nature conservation sites designated under the EEC Wild Birds Directive. All SPAs are also SSSIs.
SSSI	Site of Special Scientific Interest	The Wildlife and Countryside Act bestows a duty on the Government to designate land as an SSSI if the land is important in scientific terms due to its flora and fauna or geological features.

Appendix B: Maps of Intertidal Habitat / Epoch / Site



4a01 saltmarsh and mudflat extents (end of Epoch 1)

(N.B. LIDAR data missing for southern part of the managed realignment area)

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4a01 saltmarsh and mudflat extents (end of Epoch 2)

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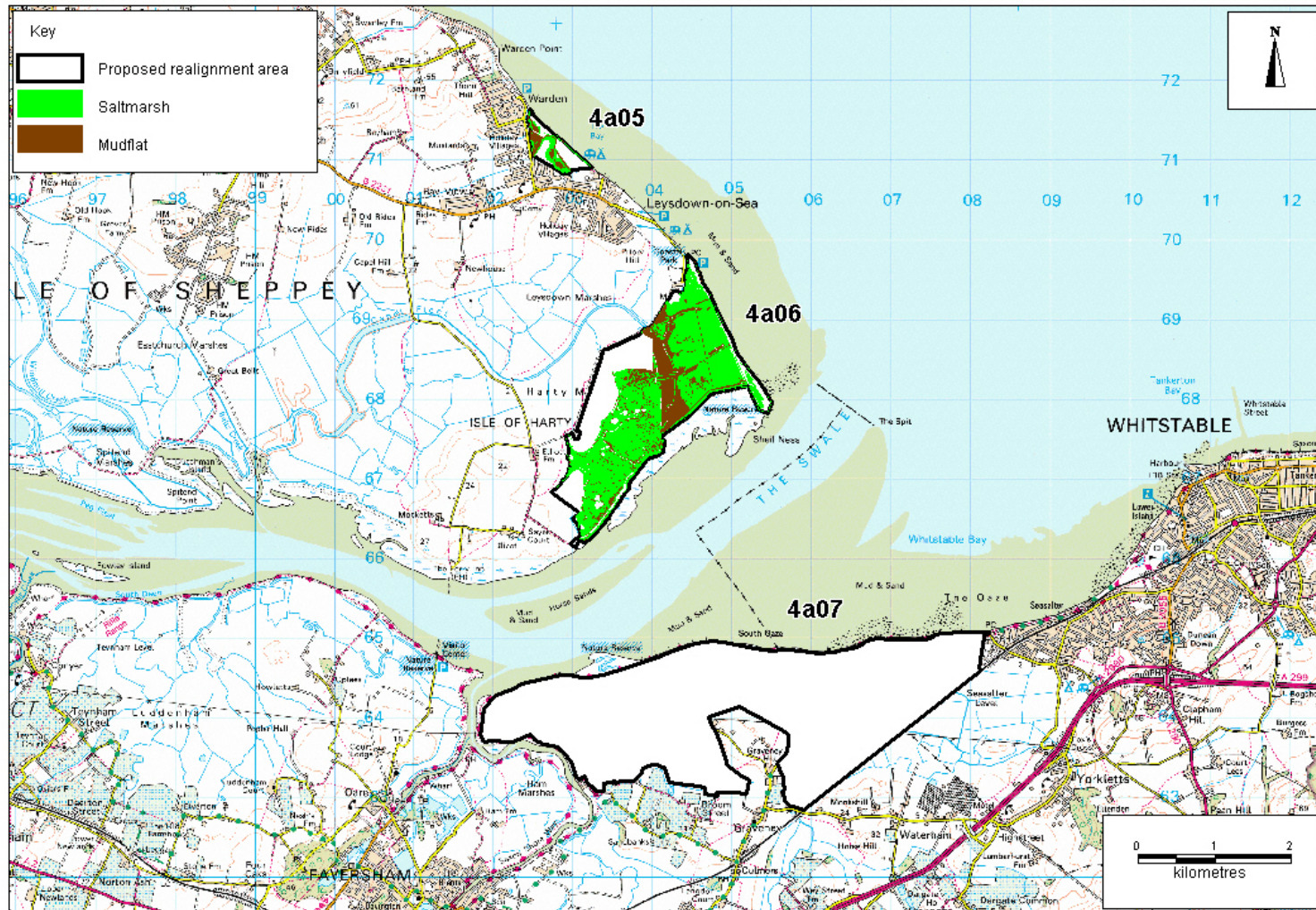


4a01 saltmarsh and mudflat extents (end of Epoch 3)

(N.B. LIDAR data missing for southern part of the managed realignment area)

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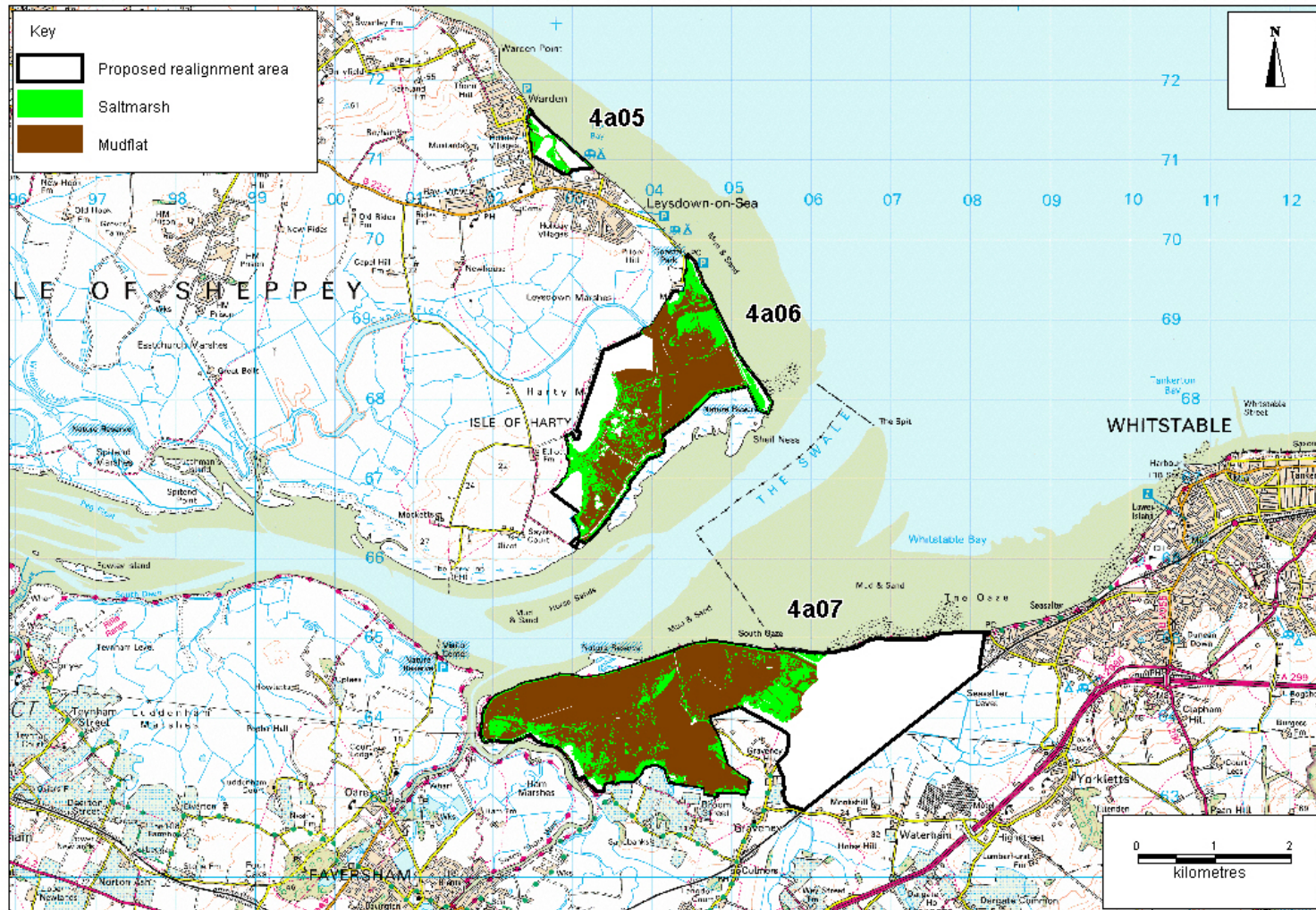




4a05, 06 & 07 saltmarsh and mudflat extents (end of Epoch 1)

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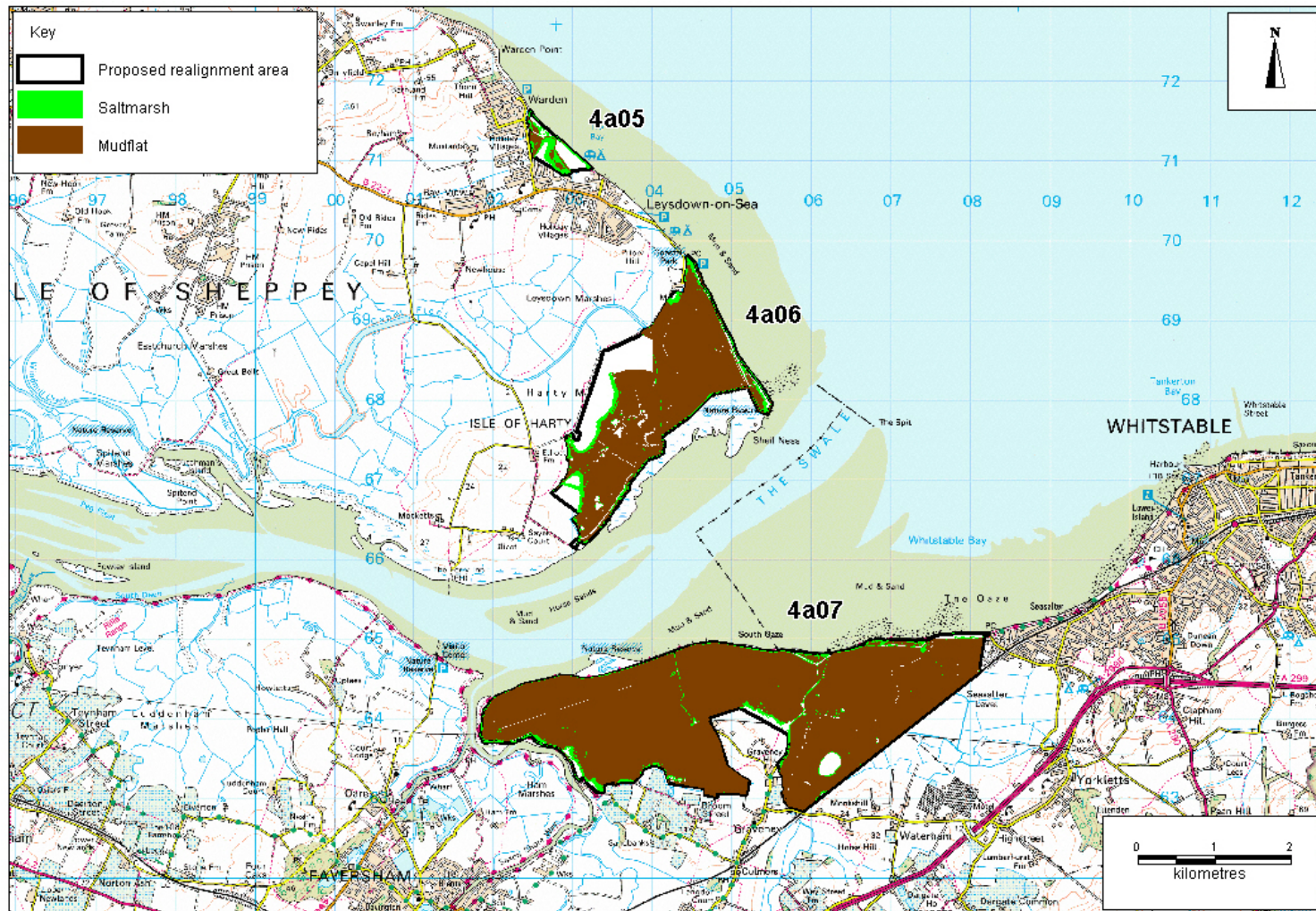




4a05, 06 & 07 saltmarsh and mudflat extents (end of Epoch 2)

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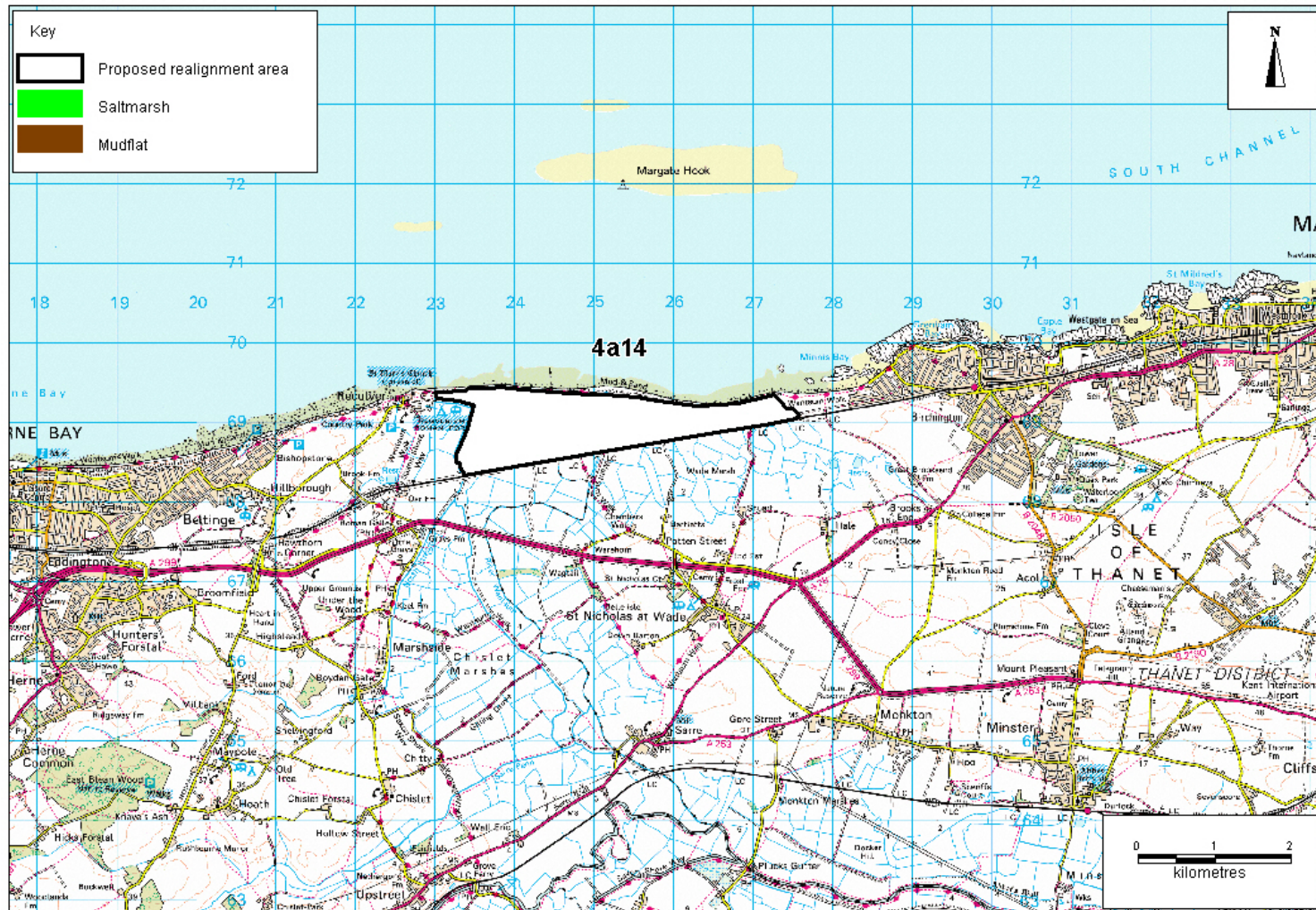




4a05, 06 & 07 saltmarsh and mudflat extents (end of Epoch 3)

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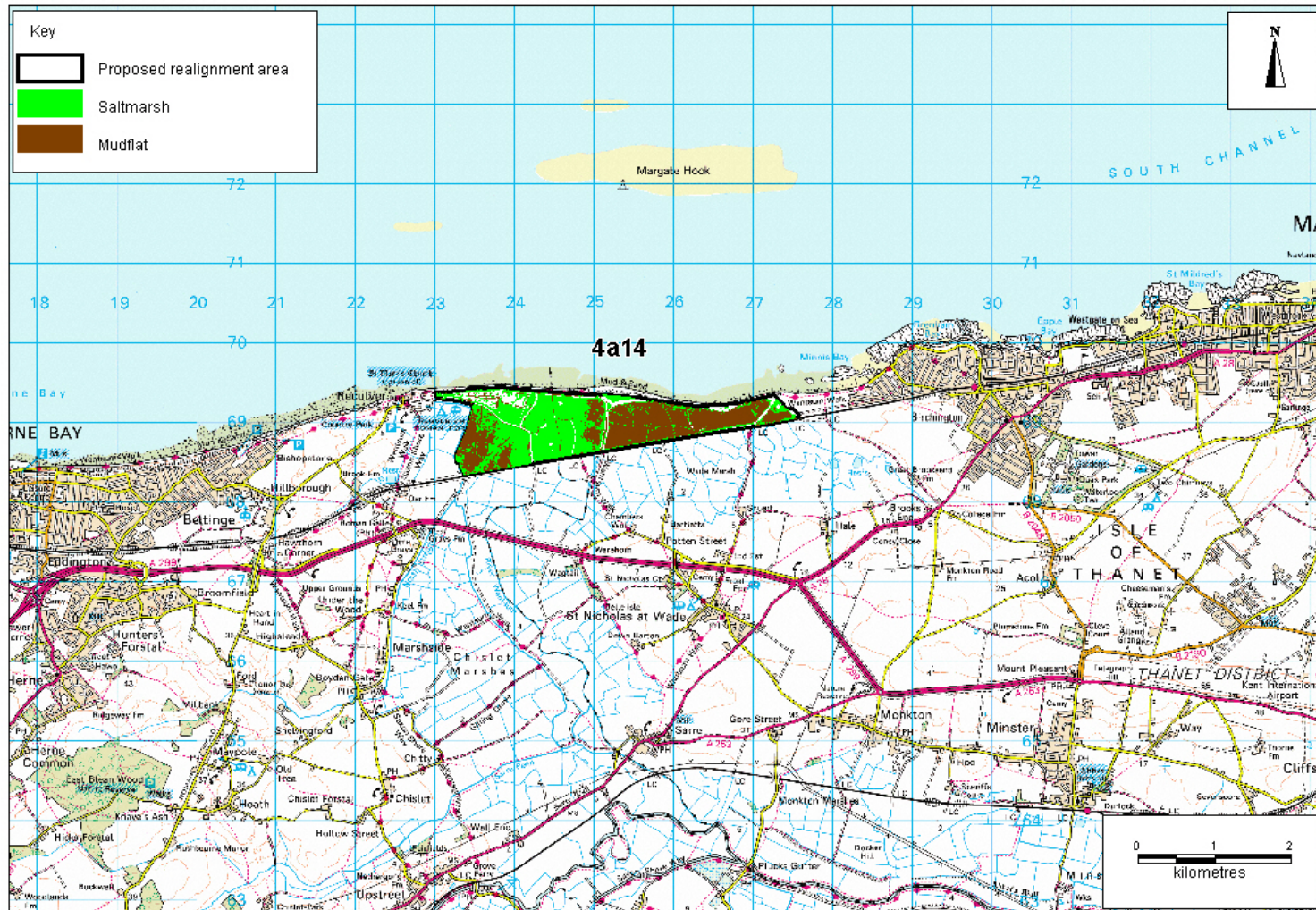




4a14 saltmarsh and mudflat extents (end of Epoch 1)

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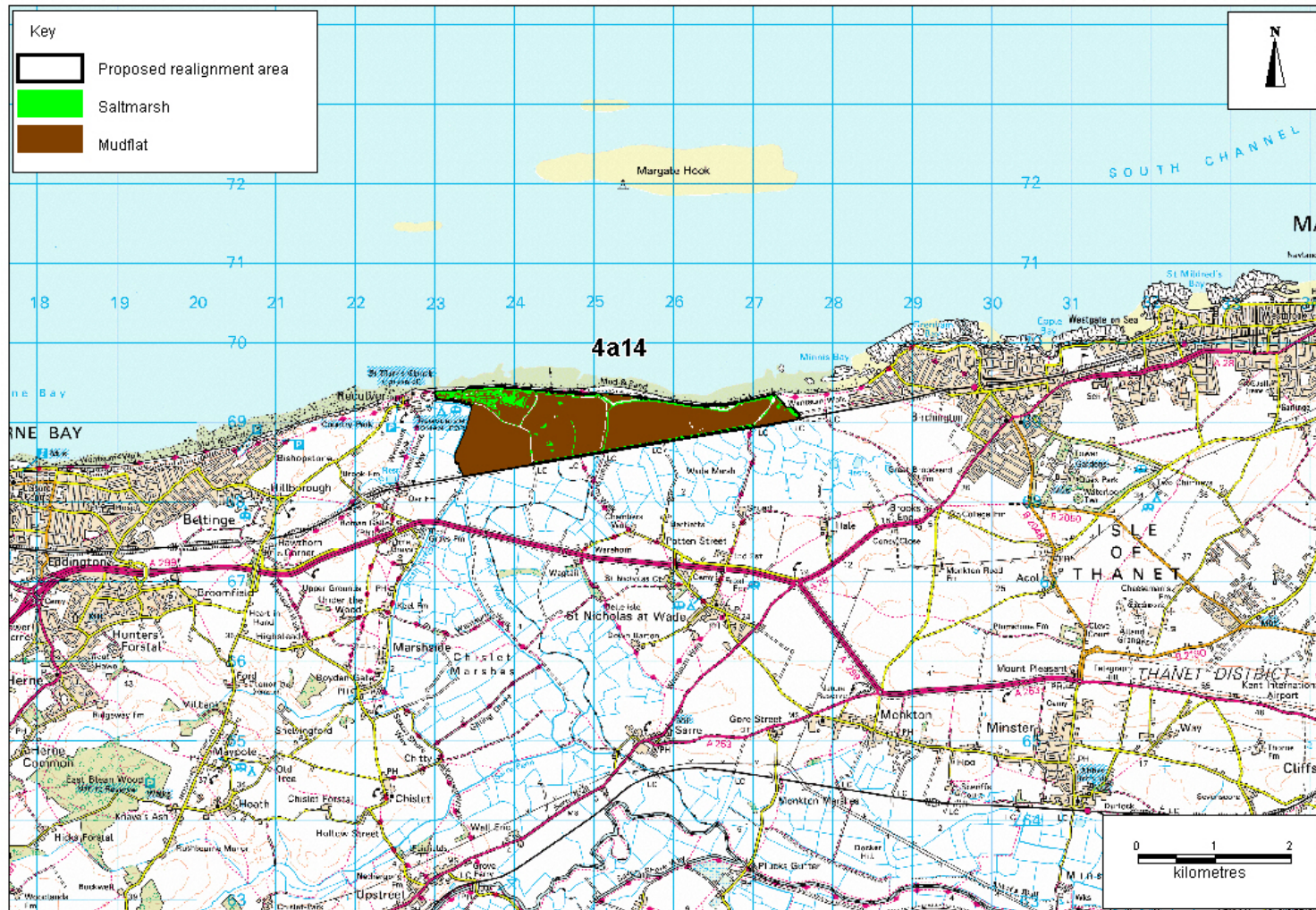




4a14 saltmarsh and mudflat extents (end of Epoch 2)

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4a14 saltmarsh and mudflat extents (end of Epoch 3)

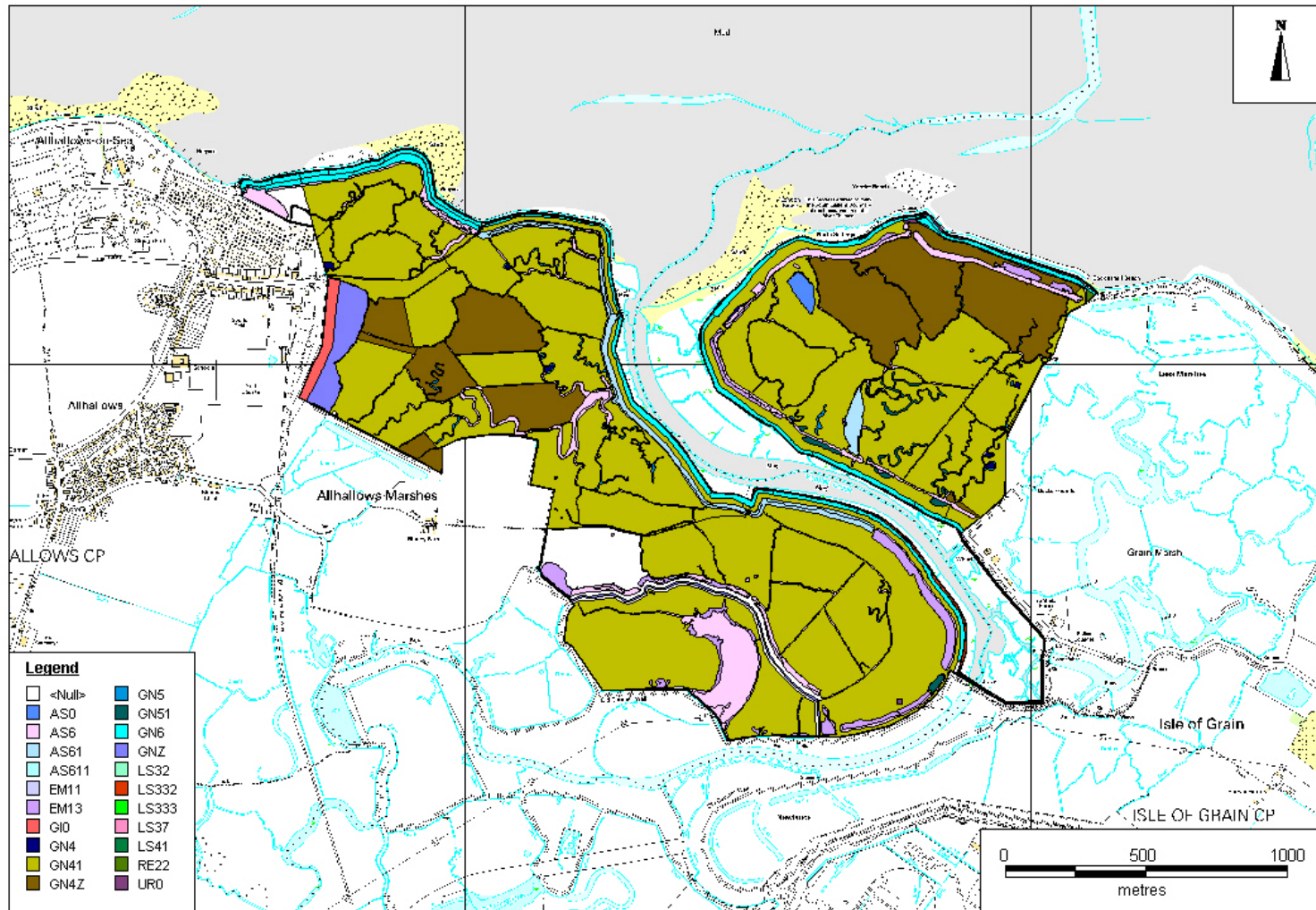
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Appendix C: Maps of Freshwater Habitat / Epoch / Site

Freshwater habitat key

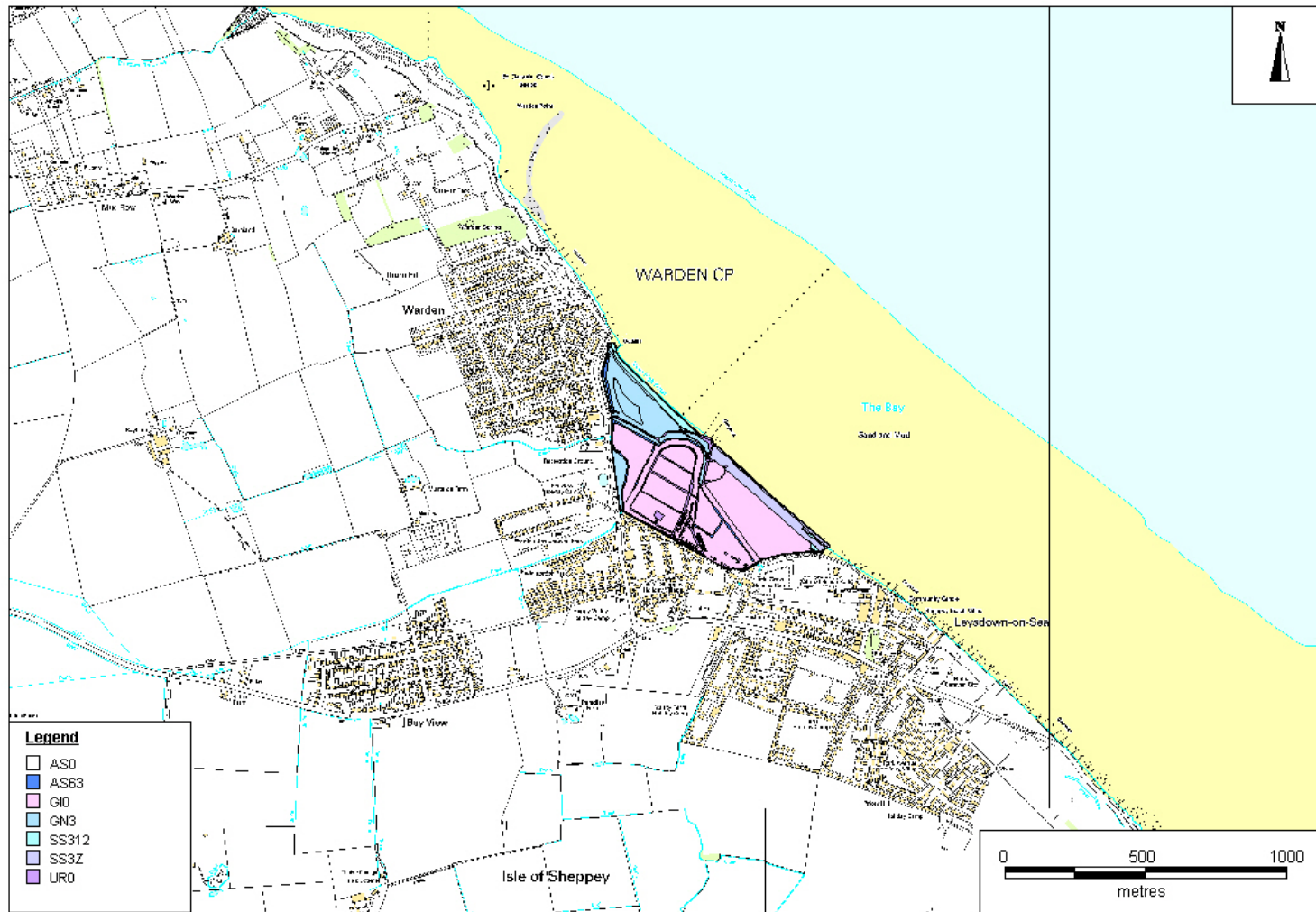
	Standing open water and canals (BHT)
	Brackish standing water (PH1)
	Saline lagoons (AN1)
	Saline ponds (TT)
	Brackish standing water (TT)
	Very brackish standing water (TT)
	Arable and horticulture (BHT)
	Intensively managed orchards (SC)
	Fen, marsh and swamp (BHT)
	Reedbeds (PHT)
	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Carex davallianae</i> (AN1)
	<i>Bolboschoenus maritimus</i> dominant community (TT)
	Other swamp vegetation (IC)
	Inundation vegetation (PH1)
	Fens [lowland] (PHT)
	Other fens, transition mires, springs and flushes (IC)
	Improved grassland (BHT)
	Coarse grassland grazing marsh (TT)
	Grazing marsh pasture (TT)
	Unimproved grazing marsh (higher quality)
	Other grazing marsh
	Inundation grassland (TT)
	Inundation grassland [brackish] (TT)
	Sea wall grassland (TT)
	Other neutral grassland (IC)
	Littoral boulders and rock (TT)
	<i>Spartina</i> swards [Cord grass] [<i>Spartinion</i>] x (AN1?)
	Transitional low-marsh (TT)
	<i>Puccinellia maritima</i> mid-marsh (TT)
	<i>Atriplex portulacoides</i> mid-marsh (TT)
	<i>Aster tripolium</i> low-marsh (TT)
	<i>Elytrigia atherica</i> upper-marsh (TT)
	Other saltmarsh (IC)
	Mudflats and sandflats not covered by sea water at low tide (AN1)
	Intertidal shingle (TT)
	Spoil heap (PH1)
	Other Supralittoral rock (IC)
	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ["white dunes"] (AN1)
	Fixed dunes with herbaceous vegetation ["grey dunes"] (AN1)
	Humid dune slacks (AN1)
	Other supralittoral sediment (IC)
	Perennial vegetation of stony banks (AN1)
	Other shingle above high tide mark (IC)
	Built-up areas and gardens (BHT)
	Scrub woodland (SC)
	Unclassified



Policy Unit 4a01 - Freshwater habitat displaced by SMP policies over 100 years

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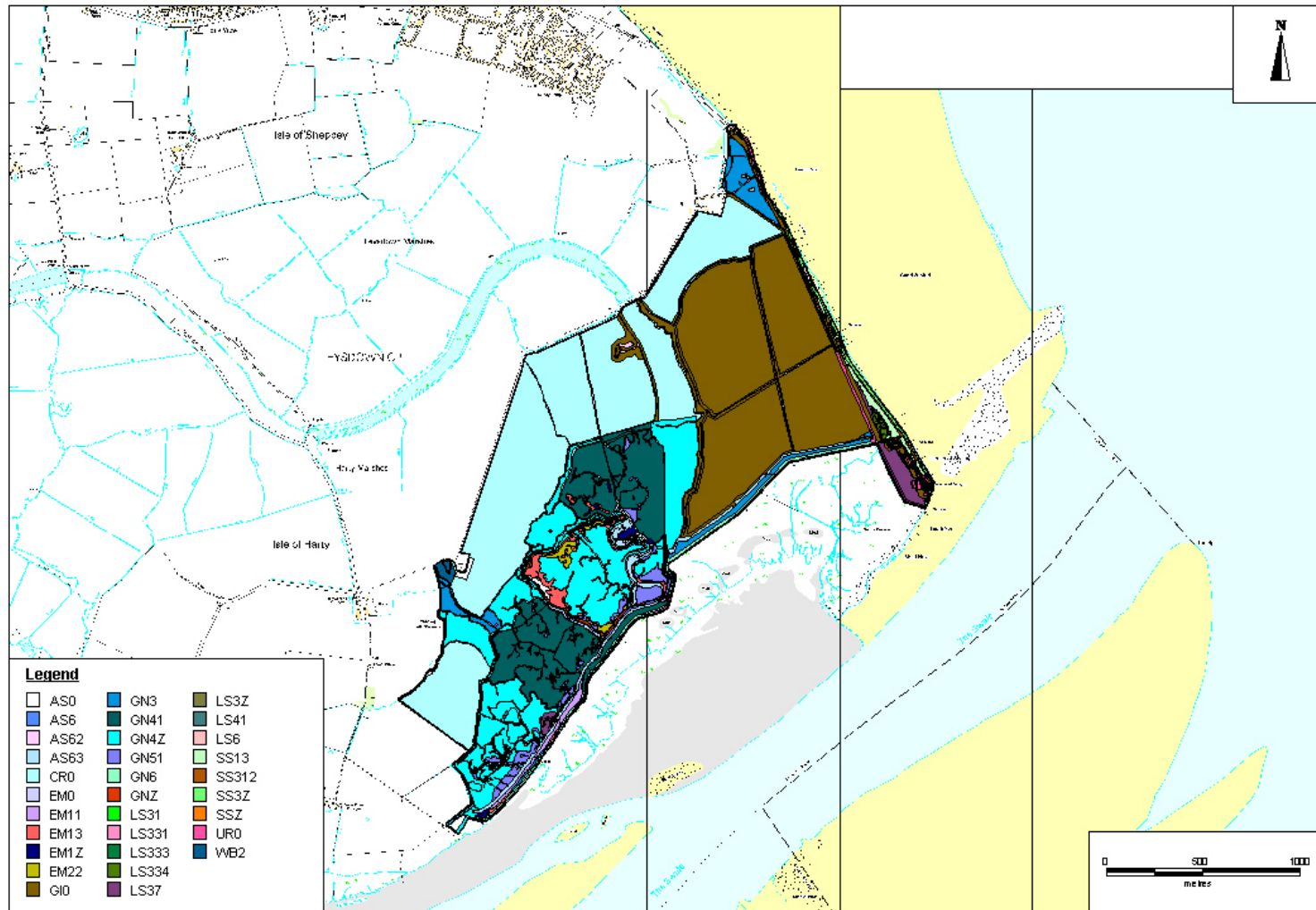




Policy Unit 4a05 - Freshwater habitat displaced by SMP policies over 100 years

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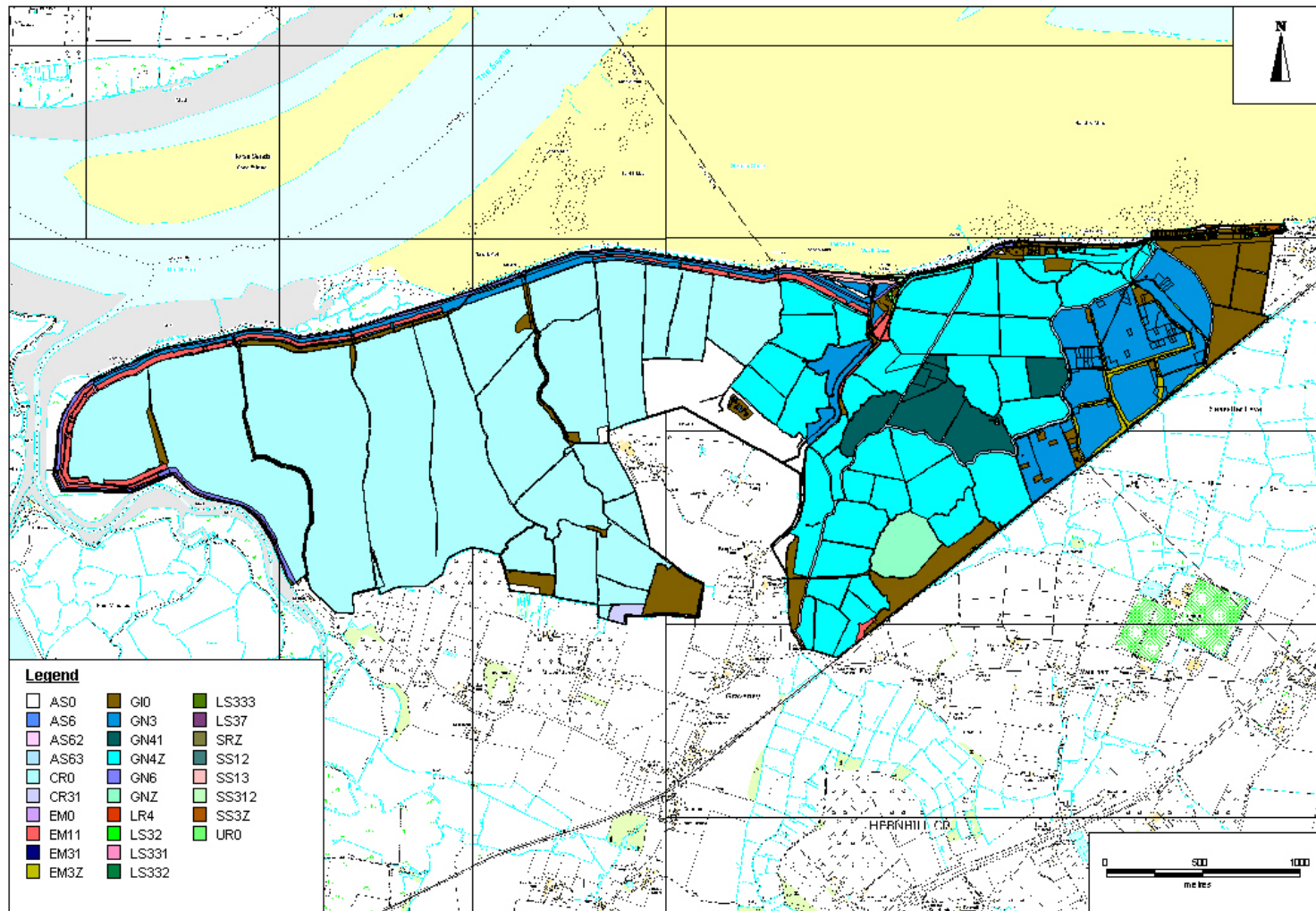




Policy Unit 4a06 - Freshwater habitat displaced by SMP policies over 100 years

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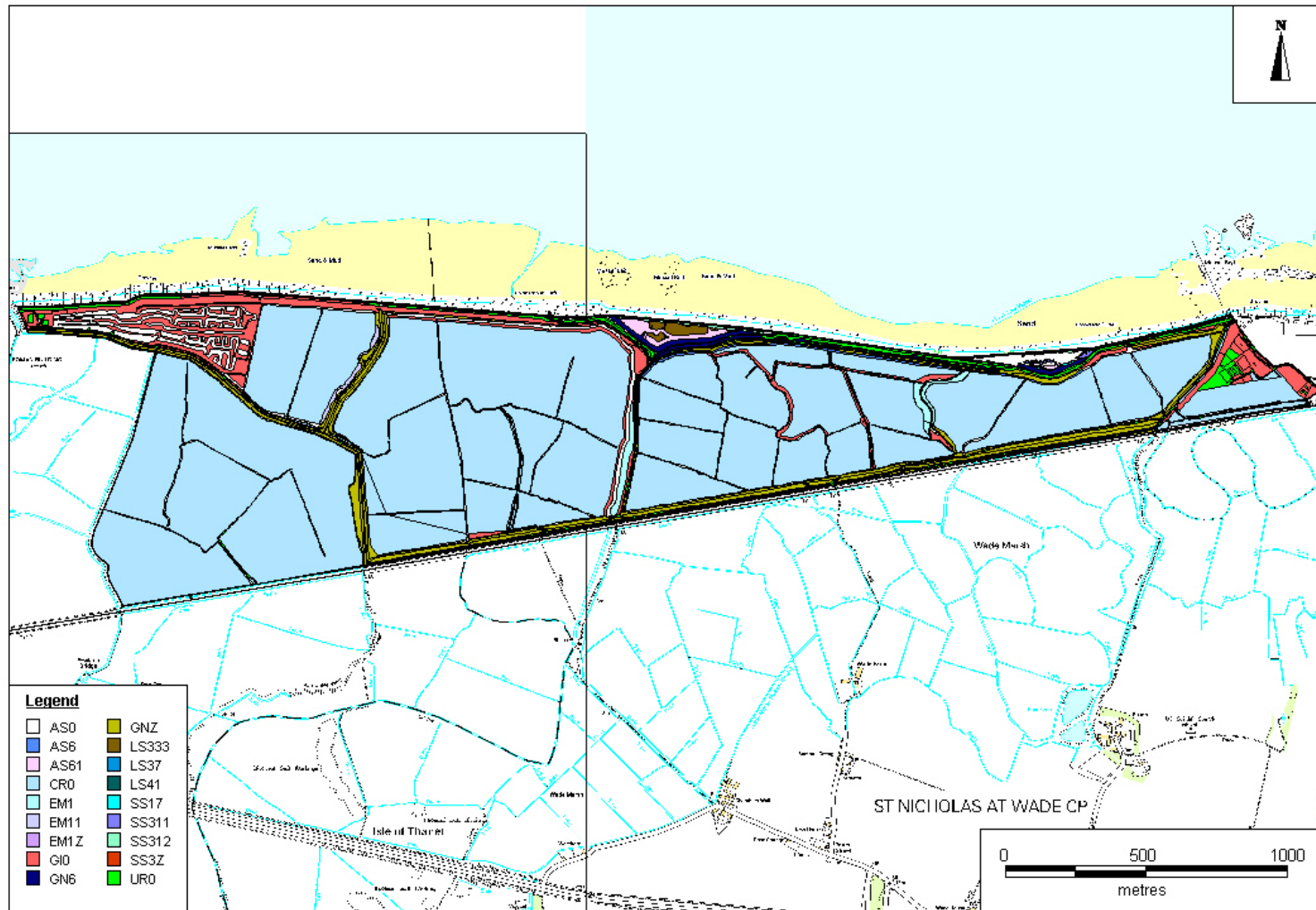




Policy Units 4a07a & 4a07b - Freshwater habitat displaced by SMP policies over 100 years

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Policy Unit 4a14 - Freshwater habitat displaced by SMP policies over 100 years

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Appendix D: HR01 Forms (Appendix 11) Environment Agency Record of Assessment of Likely Significant Effect on a European Site

Form HR01: Proforma for new applications within Stage 2 criteria.

1. Type of permission/activity	Shoreline Management Plan
2. Site reference:	<i>Isle of Grain to South Foreland</i>
3. Brief description of proposal:	<i>100 year policy plan for managing the coastline from the Isle of Grain to South Foreland. Highest Level Coastal Flood And Erosion Risk Management Strategy Plan</i>
4. European site	Thames Estuary & Marshes Special Protection Area / Ramsar Site
5. List of interest features:	<p><u>Special Protection Area</u></p> <p>Thames Estuary and Marshes contributes to the regularly occurring internationally important wintering populations of the Thames Estuary and Marshes SPA, by supporting the following Annex 1 species;</p> <ul style="list-style-type: none"> • avocet, hen harrier <p>Thames Estuary and Marshes contributes to the regularly occurring internationally important wintering populations of the Thames Estuary and Marshes SPA, by supporting the following migratory species;</p> <ul style="list-style-type: none"> • ringed plover, grey plover, dunlin, knot, black-tailed godwit, redshank <p>Thames Estuary and Marshes contributes to the internationally important waterfowl assemblage of the Thames Estuary and Marshes SPA, by supporting the following species;</p> <ul style="list-style-type: none"> • avocet, ringed plover, grey plover, dunlin, knot, black-tailed godwit, redshank, shelduck, teal, pintail, gadwall, shoveler, tufted duck and pochard <p>To support these species, the habitats required in favourable condition are as follows:</p> <ul style="list-style-type: none"> • Tidal rivers, estuaries, mud flats, sand flats, lagoons (including saltwork basins) (57.3%) • Salt marshes, salt pastures, salt steppes (1.5%) • Coastal sand dunes, sand beaches, machair, shingle, sea cliffs, islets (0.9%) • Inland water bodies (standing water, running water) (5.6%) • Bogs, marshes, water fringed vegetation, fens (3.7%) • Dry grassland, steppes (1.9%) • Humid grassland, mesophile grassland (29.1%) <p><u>Ramsar Site</u></p> <p>The Thames Estuary and Marshes Ramsar site is a mosaic of intertidal habitats, saltmarsh, coastal grazing marshes, saline lagoons and chalk pits. The site provides wintering and breeding habitats for important assemblages of wetland bird species, particularly wildfowl and waders as well as supporting migratory birds on passage. The site also provides suitable conditions for a number of notable plants and invertebrates associated with these wetland habitats.</p> <p>To support these species, the habitats required in favourable condition are as follows:</p> <ul style="list-style-type: none"> • Sand / shingle shores (including dune systems) (0.8%) • Tidal flats (49.6%) • Salt marshes (1.3%)

	<ul style="list-style-type: none"> • Freshwater lakes: permanent (0.7%) • Saline / brackish lakes: permanent (4.2%) • Saline / brackish marshes: seasonal / intermittent (3.2%) • Seasonally flooded agricultural land (38.6%) • Other (1.6%)
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6. Is the proposal directly connected with or necessary to the management of the site for nature conservation? No

7. What potential hazards are likely to affect the interest features? Are the interest features potentially exposed to the hazard?


Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:
All designated species	Negative Change in Habitat Composition	Recommended changes to land use through coastal management.
intertidal mudflats	Negative Change in Habitat Composition	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
saltmarsh	Negative Change in Habitat Composition	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
grazing marsh	Negative Change in Habitat Composition	Managed Realignment or No Active Intervention Policy resulting in negative change in habitat type.
saline lagoons	Negative Change in Habitat Composition	Managed Realignment or No Active Intervention Policy resulting in negative change in habitat type.
flooded chalk pits	Negative Change in Habitat Composition	Managed Realignment or No Active Intervention Policy resulting in negative change in habitat type.

8. Is the potential scale or magnitude of any effect likely to be significant?

a) Alone?	Policy Unit 4a01 covers a 4km section of the Thames Estuary & Marshes SPA / Ramsar site coastline. The Preferred Policy is Managed Realignment. This could have a significant on the terrestrial components of the site, whilst benefiting the estuarine components of the site. squeeze which is likely significant effect.
b) In combination with permissions and/or plans/projects?	<p>The Medway Estuary and Swale SMP2 is recommending changes to the adjacent coastline.</p> <p>The Thames Gateway project, the South East Plan and the Local Development Framework are recommending increased commercial development in the coastal plain protected by the defences.</p> <p>The Thames Estuary 2100 project is recommending changes to the adjacent coastline.</p>

9. Conclusion: Is the proposal likely to have a significant effect 'alone and/or in combination' on a European site? Yes, the proposal is likely to have a significant effect.

10. Canterbury City Council Officer:	 Andy Jeffery	Date: 17/01/2008
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11. Natural England Officer:	 Ingrid Chudleigh	Date: 17/01/2008
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IF THE PROPOSAL IS LIKELY TO HAVE A SIGNIFICANT EFFECT AN APPROPRIATE ASSESSMENT WILL BE REQUIRED.

Form HR01: Proforma for new applications within Stage 2 criteria.

1. Type of permission/activity:	Shoreline Management Plan
2. Site reference:	<i>Isle of Grain to South Foreland</i>
3. Brief description of proposal:	<i>100 year policy plan for managing the coastline from the Isle of Grain to South Foreland. Highest Level Coastal Flood And Erosion Risk Management Strategy Plan</i>
4. European site name(s) and status:	The Swale Special Protection Area / Ramsar Site
5. List of interest features:	<p><u>Special Protection Area</u> The following habitats are required in favourable condition to support the range of bird species for which the SPA is designated (indicative proportion of site %):</p> <ul style="list-style-type: none"> • Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins) (39%) • Salt marshes. Salt pastures. Salt steppes (5%) • Inland water bodies (standing water, running water) (2%) • Other arable land (47%) • Other land (including towns, villages, roads, waste places, mines, industrial sites (6%) <p><u>Ramsar Site</u> The following habitats are required in favourable condition to support the range of bird species for which the Ramsar site is designated (indicative proportion of site %):</p> <ul style="list-style-type: none"> • Sand / shingle shores (including dune systems) (1%) • Tidal flats (38%) • Salt marshes (5.8%) • Rivers / streams / creeks: seasonal / intermittent (1.8%) • Seasonally flooded agricultural land (47.7%) • Other (5.7%)
6. Is the proposal directly connected with or necessary to the management of the site for nature conservation?	No

7. What potential hazards are likely to affect the interest features? Are the interest features potentially exposed to the hazard?

Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:
All designated species	Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic	Recommended changes to land use through coastal management.
intertidal mudflats	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
saltmarsh	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
grazing marsh	Coastal change that results in an unacceptably low proportion of this habitat within the site	Managed Realignment or No Active Intervention Policy resulting in negative change in habitat type.
saline lagoons	Coastal change that results in an unacceptably low proportion of this habitat within the site	Managed Realignment or No Active Intervention Policy resulting in negative change in habitat type.
Inland Water Bodies	Coastal change that results in an unacceptably low proportion of this habitat within the site	Managed Realignment or No Active Intervention Policy resulting in negative change in habitat type.
Other Arable Land	Coastal change that results in an unacceptably low proportion of this habitat within the site	Managed Realignment or No Active Intervention Policy resulting in major reduction in habitat type.

8. Is the potential scale or magnitude of any effect likely to be significant?



a) Alone?	The Managed Realignment policies could have a significant effect on the terrestrial components of the site whilst benefitting the estuarine components of the site.
b) In combination with permissions and/or plans/projects?	<p>The Medway Estuary and Swale SMP2 is recommending changes to the adjacent coastline.</p> <p>The Thames Gateway project, the South East Plan and the Local Development Framework are recommending increased residential and commercial development in some of the coastal plain protected by the defences</p> <p>The Swale Water Level Management Plan may be affected.</p>
9. Conclusion: Is the proposal likely to have a significant effect 'alone and/or in combination' on a European site?	Yes, the proposal is likely to have a significant effect.

10. Canterbury City Council Officer:	 Andy Jeffery	Date: 17/01/2008
11. Natural England Officer:	 Ingrid Chudleigh	Date: 17/01/2008

IF THE PROPOSAL IS LIKELY TO HAVE A SIGNIFICANT EFFECT AN APPROPRIATE ASSESSMENT WILL BE REQUIRED

Form HR01: Proforma for new applications within Stage 2 criteria.

1. Type of permission/activity:	Shoreline Management Plan													
2. Site reference:	<i>Isle of Grain to South Foreland</i>													
3. Brief description of proposal:	<i>100 year policy plan for managing the coastline from the Isle of Grain to South Foreland. Highest Level Coastal Flood And Erosion Risk Management Strategy Plan</i>													
4. European site name(s) and status:	Thanet Coast Special Area of Conservation													
5. List of interest features:	<p><u>Special Area of Conservation</u> The following habitats are required in favourable condition to support the range of bird species for which the SAC is designated (indicative proportion of site %):</p> <ul style="list-style-type: none"> • Marine areas, sea inlets (87.0%) • Tidal rivers, estuaries, mud flats, sand flats, lagoons (including saltwork basins) (10.0%) • Shingle, sea cliffs, islets (3.0%) <p>In addition, this site is considered to be one of the best areas in the United Kingdom for chalk reefs and submerged or partially submerged sea caves.</p>													
6. Is the proposal directly connected with or necessary to the management of the site for nature conservation?	No													
7. What potential hazards are likely to affect the interest features? Are the interest features potentially exposed to the hazard?														
	<table border="1"> <thead> <tr> <th>Sensitive Interest Feature:</th> <th>Potential hazard:</th> <th>Potential exposure to hazard and mechanism of effect/impact if known:</th> </tr> </thead> <tbody> <tr> <td>All designated species</td> <td>Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic</td> <td>Recommended changes to land use through coastal management.</td> </tr> <tr> <td>Sea caves</td> <td>Coastal change that results in an unacceptably low proportion of this habitat within the site</td> <td>Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat</td> </tr> <tr> <td>Chalk reef</td> <td>Coastal change that results in an unacceptably low proportion of this habitat within the site</td> <td>Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat</td> </tr> </tbody> </table>	Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:	All designated species	Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic	Recommended changes to land use through coastal management.	Sea caves	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat	Chalk reef	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat	
Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:												
All designated species	Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic	Recommended changes to land use through coastal management.												
Sea caves	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat												
Chalk reef	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat												
8. Is the potential scale or magnitude of any effect likely to be significant?														
a) Alone?	<p>The preferred policy of Hold The Line could have a significant effect on the intertidal components of the site.</p> <p>The preferred policy of No Active Intervention benefits the intertidal components of the site.</p>													
b) In combination with permissions and/or plans/projects?	<p>The Medway Estuary and Swale SMP2 is recommending changes to the adjacent coastline.</p> <p>The Pegwell Bay to Kingsdown Cliffs Coastal Strategy is recommending changes to the adjacent coastline.</p>													

9. Conclusion: Is the proposal likely to have a significant effect 'alone and/or in combination' on a European site?	Yes the proposal is likely to have a significant effect.	
10. Canterbury City Council Officer:	 Andy Jeffery	Date: 17/01/2008
11. Natural England Officer:	 Ingrid Chudleigh	Date: 17/01/2008
IF THE PROPOSAL IS LIKELY TO HAVE A SIGNIFICANT EFFECT AN APPROPRIATE ASSESSMENT WILL BE REQUIRED		

Form HR01: Proforma for new applications within Stage 2 criteria.

1. Type of permission/activity:	Shoreline Management Plan
2. Site reference:	<i>Isle of Grain to South Foreland</i>
3. Brief description of proposal:	<i>100 year policy plan for managing the coastline from the Isle of Grain to South Foreland. Highest Level Coastal Flood And Erosion Risk Management Strategy Plan</i>
4. European site name(s) and status:	Thanet Coast & Sandwich Bay Special Protection Area / Ramsar Site
5. List of interest features:	<p><u>Special Protection Area</u> The following habitats are required in favourable condition to support the range of bird species for which the SPA is designated (indicative proportion of site %):</p> <ul style="list-style-type: none"> • Tidal rivers, estuaries, mud flats, sand flats, lagoons (including saltwork basins) (83.0%) • Coastal sand dunes, sand beaches, machair (1.0%) • Shingle, sea cliffs, islets (1.0%) • Humid grassland, mesophile grassland (2.0%) • Improved grassland (10.0%) • Other arable land (3.0%) <p><u>Ramsar Site</u> The following habitats are required in favourable condition to support the range of bird species for which the Ramsar site is designated (indicative proportion of site %):</p> <ul style="list-style-type: none"> • Rocky shores (15.5%) • Sand / shingle shores (including dune systems) (0.9%) • Estuarine waters (0.8%) • Tidal flats (56.0%) • Salt marshes (0.2%) • Rivers / streams / creeks: permanent (10.0%) • Freshwater marshes / pools: permanent (0.6%) • Seasonally flooded agricultural land (15.0%) • Freshwater, tree-dominated wetlands (1.0%)
6. Is the proposal directly connected with or necessary to the management of the site for nature conservation?	No

7. What potential hazards are likely to affect the interest features? Are the interest features potentially exposed to the hazard?


Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:
All designated species	Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic	Recommended changes to land use through coastal management.
intertidal mudflats	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
saltmarsh	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
shingle	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
saline lagoons	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
Chalk reef	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat

8. Is the potential scale or magnitude of any effect likely to be significant?

a) Alone?	<p>The preferred policy of Managed Realignment benefits the estuarine components of the site.</p> <p>The preferred policy of Hold The Line could have a significant effect on the intertidal componenets of the site.</p> <p>The preferred policy of No Active Intervention benefits the intertidal components of the site.</p>
b) In combination with permissions and/or plans/projects?	<p>The Medway Estuary and Swale SMP2 is recommending changes to the adjacent coastline.</p> <p>The Pegwell Bay to Kingsdown Cliffs Coastal Strategy is recommending changes to the adjacent coastline.</p>

9. Conclusion: Is the proposal likely to have a significant effect 'alone and/or in combination' on a European site? Yes the proposal is likely to have a significant effect.

10. Canterbury City Council Officer:



Andy Jeffery

Date: 17/01/2008

12. Natural England Officer:





Ingrid Chudleigh

Date: 17/01/2008



IF THE PROPOSAL IS LIKELY TO HAVE A SIGNIFICANT EFFECT AN APPROPRIATE ASSESSMENT WILL BE REQUIRED.

Form HR01: Proforma for new applications within Stage 2 criteria.

1. Type of permission/activity:	Shoreline Management Plan															
2. Site reference:	<i>Isle of Grain to South Foreland</i>															
3. Brief description of proposal:	<i>100 year policy plan for managing the coastline from the Isle of Grain to South Foreland. Highest Level Coastal Flood And Erosion Risk Management Strategy Plan</i>															
4. European site name(s) and status:	Sandwich Bay Special Area of Conservation															
5. List of interest features:	<p><u>Special Area of Conservation</u></p> <p>The following habitats are required in favourable condition to support the range of bird species for which the SPA is designated (indicative proportion of site %):</p> <ul style="list-style-type: none"> • Tidal rivers, estuaries, mud flats, sand flats, lagoons (including saltwork basins) (32.0%) • Salt marshes, salt pastures, salt steppes (15.0%) • Coastal sand dunes, sand beaches, machair (35.0%) • Inland water bodies (standing water, running water) (1.0%) • Bogs, marshes, water fringed vegetation, fens (1.0%) • Humid grassland. Mesophile grassland 5.0 • Improved grassland 10.0 • Coniferous woodland 1.0 															
6. Is the proposal directly connected with or necessary to the management of the site for nature conservation?	No															
7. What potential hazards are likely to affect the interest features? Are the interest features potentially exposed to the hazard?																
<table border="1"> <thead> <tr> <th>Sensitive Interest Feature:</th> <th>Potential hazard:</th> <th>Potential exposure to hazard and mechanism of effect/impact if known:</th> </tr> </thead> <tbody> <tr> <td>All designated species</td> <td>Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic</td> <td>Recommended changes to land use through coastal management.</td> </tr> <tr> <td>Sand dunes</td> <td>Coastal change that results in an unacceptably low proportion of this habitat within the site</td> <td>Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat</td> </tr> <tr> <td>Shingle</td> <td>Coastal change that results in an unacceptably low proportion of this habitat within the site</td> <td>Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat</td> </tr> <tr> <td>Lizard orchids</td> <td>Coastal change that results in loss of species populations.</td> <td>Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat</td> </tr> </tbody> </table>		Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:	All designated species	Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic	Recommended changes to land use through coastal management.	Sand dunes	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat	Shingle	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat	Lizard orchids	Coastal change that results in loss of species populations.	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat
Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:														
All designated species	Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic	Recommended changes to land use through coastal management.														
Sand dunes	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat														
Shingle	Coastal change that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat														
Lizard orchids	Coastal change that results in loss of species populations.	Preferred SMP Policy causes coastal squeeze. Advance the line policy encroaching onto habitat														
8. Is the potential scale or magnitude of any effect likely to be significant?																
a) Alone?	The preferred policy of No Active Intervention benefits the intertidal, sand dune and lizard orchid components of the site.															
b) In combination with permissions and/or plans/projects?	<p>The Medway Estuary and Swale SMP2 is recommending changes to the adjacent coastline.</p> <p>The Pegwell Bay to Kingsdown Cliffs Coastal Strategy is recommending changes to the adjacent coastline.</p>															

9. Conclusion: Is the proposal likely to have a significant effect 'alone and/or in combination' on a European site?	No.	
10. Canterbury City Council Officer:	 Andy Jeffery	Date: 17/01/2008
11. Natural England Officer:	 Ingrid Chudleigh	Date: 17/01/2008
IF THE PROPOSAL IS LIKELY TO HAVE A SIGNIFICANT EFFECT AN APPROPRIATE ASSESSMENT WILL BE REQUIRED.		

Form HR01: Proforma for new applications within Stage 2 criteria.

1. Type of permission/activity:	Shoreline Management Plan										
2. Site reference:	Isle of Grain to South Foreland										
3. Brief description of proposal:	100 year policy plan for managing the coastline from the Isle of Grain to South Foreland. Highest Level Coastal Flood And Erosion Risk Management Strategy Plan										
4. European site name(s) and status:	Dover to Kingsdown Cliffs Special Area of Conservation										
5. List of interest features:	<p><u>Special Protection Area</u></p> <p>The following habitats are required in favourable condition to support the range of bird species for which the SPA is designated (indicative proportion of site %):</p> <ul style="list-style-type: none"> • Shingle, sea cliffs, islets (50%) • Heath, scrub, maquis and garrigue, phygrana (10%) • Dry grassland, steppes (39%) • Other land (including towns, villages, roads, waste places, mines, industrial sites) (1%) 										
6. Is the proposal directly connected with or necessary to the management of the site for nature conservation?	No										
7. What potential hazards are likely to affect the interest features? Are the interest features potentially exposed to the hazard?											
	<table border="1"> <thead> <tr> <th>Sensitive Interest Feature:</th> <th>Potential hazard:</th> <th>Potential exposure to hazard and mechanism of effect/impact if known:</th> </tr> </thead> <tbody> <tr> <td>All designated species</td> <td>Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic</td> <td>Recommended changes to land use through coastal management.</td> </tr> <tr> <td>Vegetated sea cliffs</td> <td>Coastal squeeze between eroding cliff and arable land that results in an unacceptably low proportion of this habitat within the site</td> <td>Preferred SMP Policy causes coastal squeeze.</td> </tr> </tbody> </table>	Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:	All designated species	Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic	Recommended changes to land use through coastal management.	Vegetated sea cliffs	Coastal squeeze between eroding cliff and arable land that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze.	
Sensitive Interest Feature:	Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:									
All designated species	Change in Habitat Composition – Smaller proportions of key habitats, reduced mosaic	Recommended changes to land use through coastal management.									
Vegetated sea cliffs	Coastal squeeze between eroding cliff and arable land that results in an unacceptably low proportion of this habitat within the site	Preferred SMP Policy causes coastal squeeze.									
8. Is the potential scale or magnitude of any effect likely to be significant?											
a) Alone?	The preferred policy of No Active Intervention benefits the eroding vegetated cliff components of the site.										
b) In combination with permissions and/or plans/projects of other Competent Authorities?	<p>The Medway Estuary and Swale SMP2 is recommending changes to the adjacent coastline.</p> <p>The Pegwell Bay to Kingsdown Cliffs Coastal Strategy is recommending changes to the adjacent coastline.</p>										
9. Conclusion: Is the proposal likely to have a significant effect 'alone and/or in combination' on a European site?	No										
10. Canterbury City Council Officer:	 Andy Jeffery	Date: 17/01/2008									
11. Natural England Officer:	 Ingrid Chudleigh	Date: 17/01/2008									
IF THE PROPOSAL IS LIKELY TO HAVE A SIGNIFICANT EFFECT AN APPROPRIATE ASSESSMENT WILL BE REQUIRED.											

Appendix E: HR02 Forms (Appendix 12) Proforma for Stage 3 Habitats Regulations Assessment

Habitats Directive (Supporting document for Appendix 12)
Proforma for Stage 3: Assessing adverse effect on site
integrity – New permissions

FORM HR02: PROFORMA FOR STAGE 3 APPROPRIATE
 ASSESSMENT

PART A: Technical Consideration

1. Table 1 – Permission, plan or project details

Type of permission, plan or project	Plan: Shoreline Management Plan
Site references	1. Thames Estuary & Marshes Special Protection Area / Ramsar Site 2. The Swale Special Protection Area / Ramsar Site 3. Thanet Coast & Sandwich Bay Special Protection Area / Ramsar Site 4. Thanet Coast Special Area of Conservation

2. Table 2 – Site details

Name and Legal Status of the European site	Thames Estuary & Marshes	SPA	Ramsar
	The Swale	SPA	Ramsar
	Thanet Coast & Sandwich Bay	SPA	Ramsar
	Thanet Coast	SAC	

3. Table 3 - Features List:

Table deleted: Refer to Isle of Grain to South Foreland Shoreline Management Plan Appendix J, Appropriate Assessment

4. Report Content

Refer to Isle of Grain to South Foreland Shoreline Management Plan Appendix J, Appropriate Assessment

PART B: Summarised Conclusions

The following conclusions are extracted from the Isle of Grain to South Foreland Shoreline Management Plan Appendix J.

Thames Estuary & Marshes SPA / Ramsar

The creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network.

On the assessed extent of managed realignment, and based on the information available, **it is not possible to demonstrate that the SMP does not have an Adverse effect** due to the displacement of freshwater habitats.

As the assessment of the plan cannot conclude no adverse effect to the Thames Estuary & Marshes SPA / Ramsar that cannot be controlled conditions or use of alternatives, it therefore progresses to Stage 4 assessment.

The Swale SPA / Ramsar

The creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network.

On the assessed extent of managed realignment, and based on the information available, **it is not possible to demonstrate that the SMP does not have Adverse effect** due to the displacement of freshwater habitats.

As the assessment of the plan cannot conclude no adverse effect to The Swale SPA / Ramsar that cannot be controlled through conditions or use of alternatives, it therefore progresses to Stage 4 assessment.

Thanet Coast & Sandwich Bay SPA / Ramsar

The creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network.

Based on the assessed extent of Hold the Line and available information, the prevented gain of potential chalk reef cannot be controlled by conditions. As the actual and prevented gain of chalk reef is outside the SPA & Ramsar site, and therefore has no actual or potential effect on the existing designated chalk reef habitat, it is concluded that these policies have **No Adverse Effect** on site integrity.

Thanet Coast SAC

The creation of intertidal habitat from this policy is considered a **Beneficial effect** on site integrity, and important for the wider Natura 2000 network.

Based on the assessed extent of Hold the Line and available information, the prevented gain of potential chalk reef cannot be controlled by conditions. As the actual and prevented gain of chalk reef is outside the SAC, and therefore has no actual or potential effect on the existing designated chalk reef habitat, it is concluded that these policies have **No Adverse Effect** on site integrity.

PART C: STAGE 3 CONCLUSION

CAN IT BE ASCERTAINED THAT THE PLAN OR PROJECT WILL NOT ADVERSELY EFFECT THE INTEGRITY OF THE EUROPEAN SITE(S)?

THIS CANNOT BE ASCERTAINED AS THE PLAN MAY HAVE AN ADVERSE EFFECT.

Name of CCC officer undertaking appropriate assessment:

Signed: Andy Jeffery

Date: 23rd September 2009

Endorsed by:

Signed: Ted Edwards

Date: 23rd September 2009

Natural England COMMENTS ON APPROPRIATE ASSESSMENT:

IS THERE AGREEMENT WITH THE CONCLUSION? YES



Signed:

Dr Chris McMullon (Natural England SE Coastal Senior Specialist)

Date: 23rd September 2009

Appendix F: Stage 4 (Appendix 20) Proforma for Secretary of State consideration

Habitats Directive – Appendix 20

Information to the Secretary of State/National Assembly for Wales according to Regulations 49(5) and 51(2) of the Habitats Regulations

A: Administration details

Date: September 2009

Contact person: Andy Jeffery
(HRA Project Manager)

Address: Canterbury City Council
Military Road
Canterbury
Kent
CT1 1YW

Tel: 01227 862576

Fax: 01227 784013

E-mail: andy.jeffery@canterbury.gov.uk

B: Site details

Name of European sites where unable to conclude no adverse effect:

- Thames Estuary and Marshes. This site is a classified Special Protection Area (SPA) and a Ramsar site hosting a priority habitat/ species.
- The Swale. This site is a classified Special Protection Area (SPA) and a Ramsar site hosting a priority habitat/ species.
- Thanet Coast & Sandwich Bay. This site is a classified Special Protection Area (SPA) and a Ramsar site hosting a priority habitat/ species.
- Thanet Coast. This site is a classified Special Area of Conservation (SAC) hosting a priority habitat/ species.

C: Summary of the plan or project having an effect on the sites

This is a Shoreline Management Plan (SMP) for the Isle of Grain to South Foreland in North and East Kent.

A SMP is a non-statutory, policy document for coastal flood and erosion risk management planning. The main objective of a SMP is to identify sustainable long-term management policies for the coast. The plan enables social, environmental and economic assets effected by coastal flood and erosion to be managed in the best way over the long term.

The SMP has been produced by Canterbury City Council and Halcrow, according to latest government guidance (Defra, 2006). The shoreline management policies considered are those defined in this guidance: Hold the [defence] Line, Advance the line, Managed Realignment and No Active Intervention.

SMPs are high level, strategic plans. The policies they set are further developed and appraised prior to implementation of any new flood defence and coastal erosion works – this can be through undertaking flood and coastal erosion risk management strategies, informed by technical and environmental studies.

A map of the area that this SMP covers can be found in Appendix H of the Habitats Regulations Assessment.

Based on the precautionary principle of the Habitats Regulations, **we are unable to conclude that this SMP alone and in combination will have no adverse effect** on the site integrity of the European sites listed in Box B. The conditions attached to this approval to ensure that the least damaging plan is implemented are set out in Box F.

This SMP will be approved by the Environment Agency in November 2009.

D: Summary of the assessment of the negative effects on the sites

This SMP recommends a suite of Managed Realignment and Hold The Line policies that have a likely significant effect on the Thames Estuary & Marshes SPA, the Thames Estuary & Marshes Ramsar Site, the Swale SPA, Swale Ramsar Site, the Thanet Coast & Sandwich Bay SPA, the Thanet Coast & Sandwich Bay Ramsar Site, and the Thanet Coast SAC.

At this strategic level of study, we cannot guarantee that these Managed Realignment policies will not have an adverse effect on grazing marsh and standing water habitats within these sites. Based on the precautionary principle of the Habitats Regulations, **we are unable to conclude that this SMP alone and in combination will have no adverse effect** on the site integrity of these sites.

We have determined that displacement of other freshwater features is acceptable modification to the sites or can be mitigated through application of conditions.

Further detail can be found in the main report for the Habitats Regulations Assessment.

E: Modifications or restrictions considered

Possible modifications or restrictions were assessed to mitigate the potential adverse effects of this SMP on the site integrity of the designated sites. The objective of these was to determine the acceptable extent of managed realignment to manage the local and wider Natura 2000 in the most sustainable way into the future. This would be delivered through the application of the following conditions:

1. investigations (ecological survey) to increase understanding of the site conditions necessary to maintain site integrity;
2. informed mitigation and;
3. modification of the realignment extent to cause no adverse effect.

However, we cannot at this stage (without information from steps 1 and 2 above) guarantee that this process will ensure no adverse effect on the grazing marsh and standing water habitats of the designated sites. Therefore, following the precautionary principle, the effects of this SMP cannot be controlled by modifications or restrictions.

F: Alternative Solutions considered

We have identified the following potentially less damaging alternatives:

- a) Hold the Line policies, or
- b) Managed Realignment with a Controlled Extent (to minimise ecological impact)

We have consulted the 'Appropriate Nature Conservation Body' (Natural England) to advise on which of these alternatives is the least damaging. Natural England have advised that alternative b), Managed Realignment with a Controlled Extent (to minimise ecological impact), is the least damaging alternative.

The letter we have received from Natural England is in Annex 1 of this document.

In partnership with Natural England, we have identified the following conditions to be applied to ensure that the least damaging alternative is determined:

1. investigations (ecological survey) to increase understanding of the site conditions necessary to maintain site integrity;
2. informed mitigation and;
3. modification of the realignment extent to best manage site integrity and cause minimum adverse effect.

Option b) is the the option that this SMP adopts (see also Box C). The conditions listed above are part of the SMP (they are included within the Action Plan which sets out how the SMP policies will be implemented)

G: Imperative Reasons of Overriding Public Interest

Coastal flooding and erosion in this SMP area poses risks to approximately 38,000 residential and commercial properties, one major and one minor port, two major power stations, key infrastructure such as roads and railway lines and agricultural land. With sea level rise and increased coastal storminess, we forecast increased risks of flooding and erosion resulting in increased risk to life and properties. We also forecast loss of intertidal habitat due to sea level rise effects.

This SMP coordinates the management of these risks to ensure that the social, environmental and economic impacts of coastal flooding and erosion are managed in the best way over the long term. Without the plan, coastal engineering in the area may be uncoordinated, ineffective and miss opportunities to manage the coastal environment in the most balanced and positive way.

In partnership with Natural England, we have identified the least damaging alternative to manage this coastline and its designated habitats over the next 100 years.

Therefore, the reasons to carry out this SMP notwithstanding the assessment of adverse effect on site integrity are:

- A need to address a serious risk to human health and public safety (uncontrolled flood and erosion risks to large residential populations);
- Where failure to proceed would have unacceptable social and/or economic consequences (loss of economic infrastructure, commercial property and community areas) through coastal flood and erosion damage;
- Whilst this is a damaging plan, it is the least damaging option for the designated sites (see Box F) and will be helping them to adjust to the impacts of sea level rise. This SMP therefore has beneficial consequences of primary importance for the environment.

H: Compensatory measures

Our conclusion of adverse effect in this assessment is precautionary. We do not yet know that there will definitely be an effect, nor the scale of any effect. This will be informed by the study required under the condition of implementation stated in Box F.

However, we have secured the following programme of habitat compensation within the Environment Agency Southern Regional Habitat Creation Programme:

- Epoch 1 - 0-20 years: 115Ha Grazing Marsh
- Epoch 2 - 20-50 years: 408Ha Grazing Marsh
- Epoch 3 - 50-100 years: 679Ha Grazing Marsh

Habitat Creation programmes are Government's (DEFRA) recommended vehicle for delivering strategic habitat compensation and are funded in advance of engineering works that cause damage. The EA Southern RHCP is a dedicated, resourced plan for achieving a constant process of delivering compensatory habitat.

In order to comply with the condition of implementation, damaging activities cannot progress until compensation is provided and in a functional state. The extents required will be fully functioning by the end of the epoch to which they relate.

The study referred to above will inform what function these habitats must perform and the exact extent of habitat compensation required. The estimates for the first 2 epochs are based on the current best available information regarding the damaging effects of Hold the Line policies in this SMP area (the draft Greater Thames Coastal Habitat Management Plan (CHaMP), 2008). The estimate for the third epoch is based on the SMP information on the most sustainable shape of the estuary. Should a greater extent than this be required in Epoch 3, this could be compensated for outside of this SMP area.

In line with condition 1 in Box F, study and monitoring will be undertaken and there will be periodic reviews of this SMP (at 5–10 year intervals). This will inform the ongoing process of habitat compensation.

I: Supporting Documentation

List of attached technical supporting documents:

Annex 1 – Natural England letter containing advice on least damaging alternatives

Date: 4 November 2008
Our ref: Open Coast SMP AA
Your ref: HRA Alternatives Request



Andy Jeffery
Canterbury City Council
Military Road
Canterbury
CT1 1YW

South East Region
Coldharbour Farm
Wye
Ashford
Kent
TN25 5DB

T 01233 812525
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Dear Andy

**ISLE OF GRAIN TO SOUTH FORELAND SHORELINE MANAGEMENT PLAN
HABITATS REGULATIONS ASSESSMENT: DETERMINATION OF LEAST DAMAGING
ALTERNATIVE**

The Swale Estuary and Marshes Special Protection Area (SPA) and Ramsar site

Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar site

Thanet Coast and Sandwich Bay Special Protection Area (SPA) and Ramsar site

Thanet Coast Special Area of Conservation (SPA)

In response to your request for our formal advice on the least damaging alternative for this Shoreline Management Plan (SMP), we advise the following:

1. We have previously agreed that the SMP constitutes an Adverse Effect on the Integrity of the sites listed above as we cannot guarantee the 'Indicative Extents' of Managed Realignment policies will not damage grazing marsh and standing water features.
2. We agree with your identification of less damaging alternatives.
3. Based on the best available information as recently produced by the Greater Thames Coastal Habitat Management Plan (CHaMP), Hold the Line is now considered a damaging policy within all epochs due to the plan's predicted loss of intertidal habitat through coastal squeeze. We do not consider Hold the Line to be the least damaging alternative for any epoch of the plan based on this information.
4. Having reviewed the SMP policies within and outside the designated areas plus their respective timing, we confirm that the least damaging alternative policy is Managed Realignment with a Controlled Extent (to minimise ecological impact) for all Managed Realignment policies affecting the designated sites.
5. The Greater Thames CHaMP predicts a greater loss of intertidal habitat through coastal squeeze in the first epoch than can be managed by realignments outside the designated areas. We consider it necessary to retain Managed Realignment policies affecting the designated sites within the first and later epochs to manage this habitat loss. In the best interests of managing this coast in line with the Habitats Regulations and other SMP drivers, we do not consider it necessary or beneficial to alter the epochs to which the SMP policies are currently assigned.

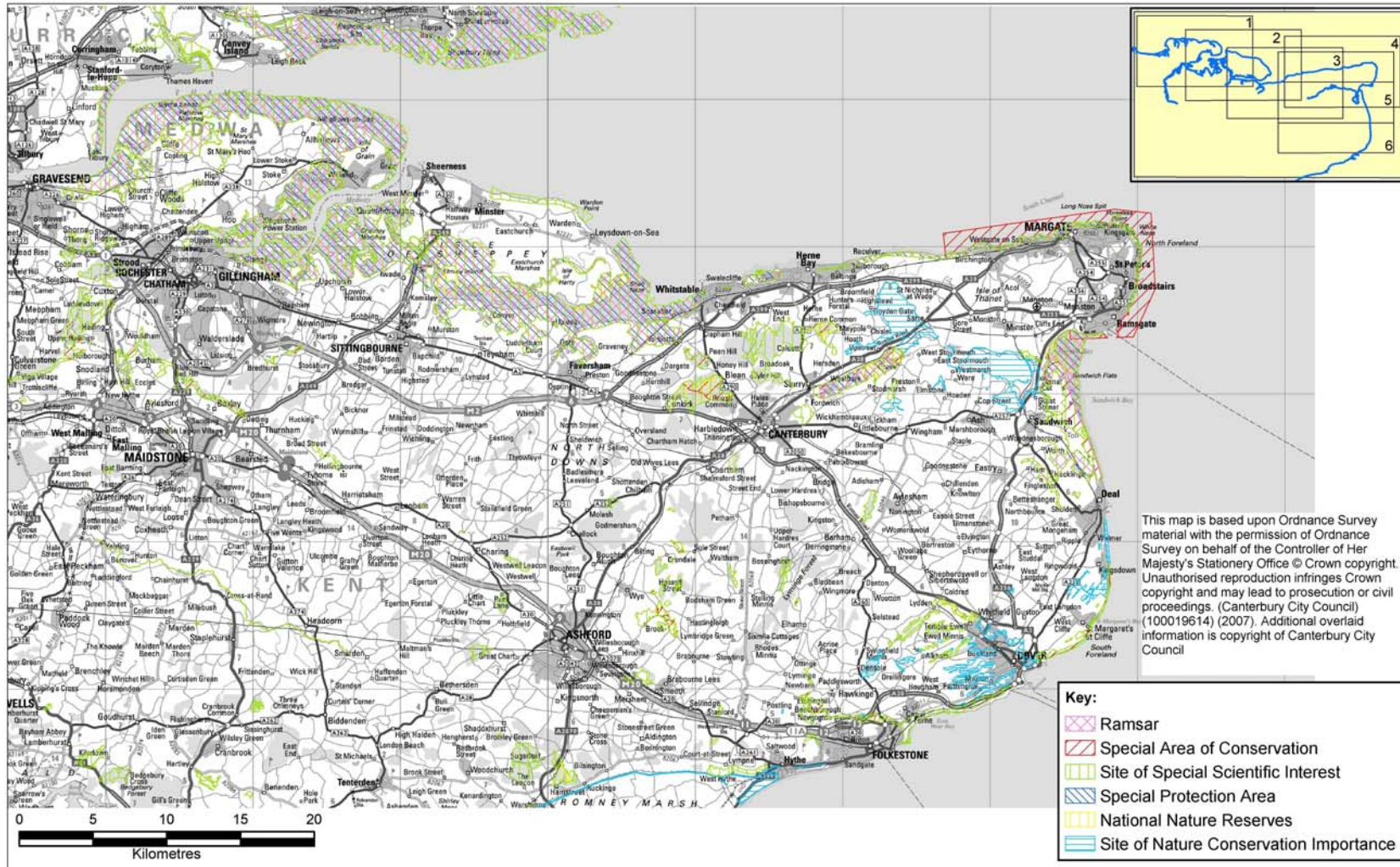
Based on this advice and, assuming the SMP passes the tests of Imperative Reasons of Overriding Public Interest, we recommend that we work together at the earliest opportunity to determine and secure appropriate compensation measures.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Dr Chris McMullon', with a small horizontal line at the end.

Dr Chris McMullon
Senior Coastal Specialist
Natural England - SE Region

Appendix G: Map of European Sites and Citations



Halcrow

Project: Isle of Grain to South Foreland

Title: Nature Conservation Designations

Appendix H: Maps of Policy Units



Isle of Grain to South Foreland SMP Policy Units (Part 1)

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Isle of Grain to South Foreland SMP Policy Units (Part 2)

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Isle of Grain to South Foreland SMP Policy Units (Part 3)

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Isle of Grain to South Foreland SMP Policy Units (Part 4)

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Appendix I:

Isle of Grain to South Foreland SMP – Geomorphological Advice (Lee, 2009)

Isle of Grain to South Foreland SMP: Geomorphological Advice

Executive Summary

Over the next 100 years the chalk reefs on the Thanet coast will be affected by 4 main habitat change scenarios:

1. Loss of littoral and corresponding gain of sub-littoral habitat due to platform submergence caused by the combined effects of relative sea-level rise (RSLR) and shore platform lowering (a form of *coastal squeeze*; applicable under both “No Active Intervention” and “Hold the Line” policy options).
2. Gain of littoral habitat on the unprotected cliffline due to ongoing cliff erosion (applicable under a “No Active Intervention” policy option).
3. Gain of littoral habitat on the currently protected cliffline due to failure of the coastal defences and renewal of cliff erosion (applicable under a “No Active Intervention” policy option).
4. “Prevented Gain”; holding the existing defence line prevents cliff erosion and the formation of new littoral shore platform (applicable under a “Hold the Line” policy option).

The Appropriate Assessment report prepared for the SMP2 focuses on scenarios 2 and 4 and does not consider the habitat changes associated with platform submergence (scenario 1).

The Appropriate Assessment compares the preferred SMP2 policy with a “natural change” scenario in which the existing defences are assumed to be not in place. This is an artificial construct and does not reflect reality where the defences would fail at the end of their residual life and continue to provide some protection. SMP2 policies are normally compared with a baseline “do nothing” scenario (i.e. “No Active Intervention”) which indicates the expected habitat change if the current defences were allowed to fail.

In a high-level analysis undertaken for this report, the 100-year habitat loss/gain account is dominated by the effects of platform submergence (scenario 1), which could result in the change of over 200ha of littoral reef habitat to sub-littoral habitat, assuming RSLR consistent with High Emissions predictions. However, the scale of these changes is sensitive to future RSLR scenarios and shore platform lowering rates.

The on-going erosion of the unprotected cliffs would deliver around 15ha of littoral habitat gains (scenario 2). The renewed erosion of the currently protected cliffline would deliver around 10ha of littoral habitat under a No Active Intervention policy (scenario 3). The same area can be considered “prevented gain” under a With Present Management policy (scenario 4).

1 Introduction

This report has been prepared in response to the request for advice relating to the impact of SMP policies on the physical evolution of the Isle of Thanet chalk reef habitats. These habitats are designated as Special Area of Conservation (SAC) and have developed on shore platforms which extend seawards from the base of the chalk cliffs. The reefs include both littoral (i.e. inter-tidal) and sub-littoral (i.e. sub-tidal) habitats.

For much of their 26km length the Thanet chalk cliffs are protected by concrete seawalls, promenades and groynes fields. Only around 6km remain unprotected.

The policies being developed in the SMP2 are “Hold the Line” (HTL) on the currently protected sections and “No Active Intervention” (NAI) on the unprotected sections. It is recognised that HTL policies will prevent the creation of new areas of shore platform and, hence, chalk reef. In addition, the shore platform will continue to lower and the proportion of sub-littoral reef will increase.

The specific questions to be addressed are itemised in the Service Order of 9 March 2009 can be summarised as follows:

- will HTL policies increase reflected wave energy and so increase the rate of lowering of the shore platform?
- what cliff erosion and shore platform lowering rates can be expected in the future?
- what habitats loss/gain might be expected over the SMP2 time period (100 years) under different shoreline management scenarios?
- is the loss of chalk reef from HTL policies significant compared with “natural change”?

This report has been based on a 1-day field visit with Ingrid Chudleigh (NE) and Dr Brian D’Olier), together with a review of the following documents:

- Isle of Grain to South Foreland SMP2 consultation draft document;
- Isle of Grain to South Foreland SMP2 Appendix J: Appropriate Assessment report;
- Dr Brian D’Olier (2007) Erosion rate study – Isle of Thanet coastline.

Broad-scale estimates of habitat change associated with the preferred SMP2 policy are presented. These are compared with a baseline “do nothing” scenario (“No Active Intervention”) which indicates the expected habitat change if the current defences were allowed to fail. This approach is consistent with the way in which SMP2 policies are appraised.

However, this is different from the approach taken in the Appropriate Assessment where the habitat changes associated with the SMP2 policy are compared with a “natural change” scenario where the existing defences are absent.

2 Cliff Erosion Rates

D'Olier (2007) presents a range of predicted erosion distances for 21 cliff sectors around the Thanet coast, over 3 time periods: 0-20 years, 20-50 years, 50-100 years. These predictions take account of D'Olier's previous studies on this coast, the comparison of coastal photographs from different dates (particularly 1988, 1998, 2007) and the results of cliff top monitoring at North Foreland Estate (9 measurements over the period 1995-2007). The predicted rates also included an unspecified allowance for the changes in storminess and rate of relative sea-level rise (RSLR) that are expected to occur over the next 100 years.

Table 1 Summary of erosion rates at 21 cliff sectors (derived from D'Olier, 2007)

	Lower Bound: Average Annual Erosion Rate (m/year)			Upper Bound: Average Annual Erosion Rate (m/year)		
	Year 0-20	Year 20-50	Year 50-100	Year 0-20	Year 20-50	Year 50-100
Min	0.05	0.02	0.02	0.05	0.06	0.06
Max	0.15	0.1	0.15	0.35	0.4	0.5
Mean	0.07	0.05	0.06	0.17	0.17	0.18

D'Olier (2007) does not present predicted average annual erosion rates for each cliff sector. However, these can be easily calculated from the range of erosion distances listed in the report. These results are summarised in the Table 1 below with a more detailed breakdown presented in Table A.1 (see Appendix A).

A number of points are worth making:

- the predicted Upper Bound erosion rates have an order of magnitude range, from 0.05m/year to 0.5m/year. The predicted Lower Bound estimates range from 0.02m/year to 0.15m/year. These ranges reflect the varying conditions around the cliffline and the uncertainty in future estimates.
- on the protected coast (see Table A.1) future predictions appear to assume that the existing defences are removed in Year 0 i.e. they do not influence future erosion rates.
- erosion rates do not increase significantly over the next 100 years. For example, in the Upper Bound estimate the mean rate increases from 0.17m/year to 0.18m/year. This suggests that future changes in the rate of RSLR were not considered to have a major influence on erosion rates.

D'Olier (2007) does not mention that there has been a number of previous studies which have measured erosion rates along the Thanet chalk cliffline:

- Sewell¹ (1959) reported average rates of 0.3m/year for the Thanet cliffs;

¹ Sewell G E 1959. Sea defence works from West Bay, Westgate, to Epple Bay, Birchington. Institution of Municipal Engineers and Association of Kent Surveyors.

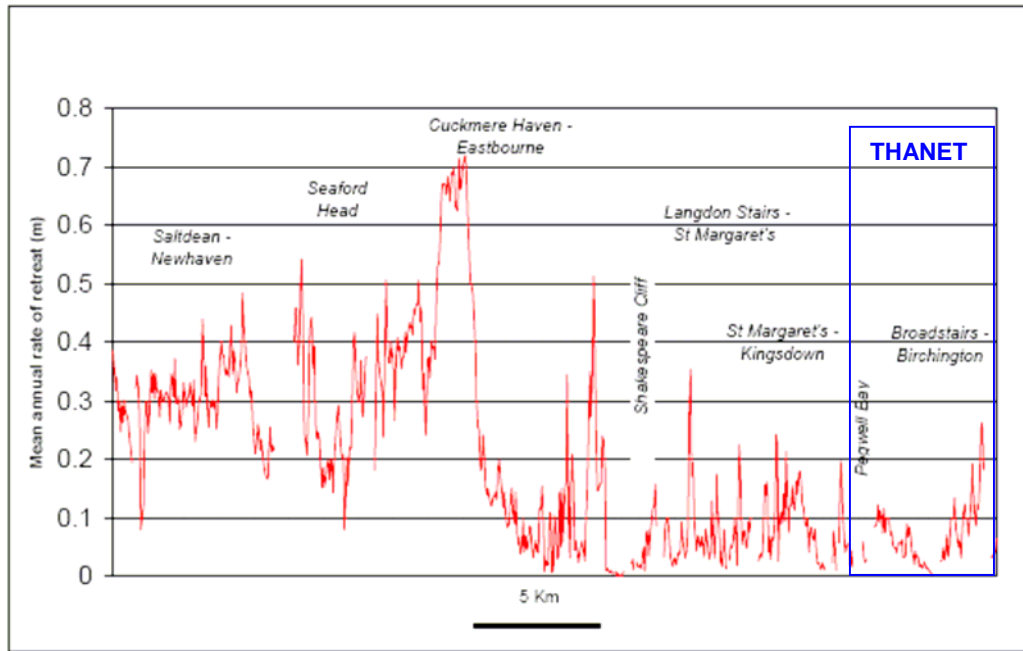


Figure 1 Mean annual rate of chalk cliff retreat along the east Sussex and Kent frontage for the period 1870s to 2001. Names refer to start and end points of each cliff section. Isle of Thanet cliffs highlighted by the blue box.

- May and Heeps² (1985) estimated rates of between 0.05m/year and 0.3m/year, based on a comparison of Ordnance Survey maps from the 19th century and 1938 (Table 2).
- the Beaches at Risk team at Sussex University³ have established the erosion rates for chalk cliffs along the Eastern Channel coast for the period 1870s to 2001 (Figure 1), based on map evidence. Their analysis indicates erosion rates for the Thanet cliffs of around 0.05m/year to around 0.25m/year.

Table 2 Thanet chalk cliff erosion rates (from May and Heeps, 1985)

Site	Period	Average annual erosion rate (m/year)
Pegwell coast guard station	1839-1938	0.05
Kingsgate	1842-1938	0.15
White Ness	1842-1938	0.05
E Epple Bay	1972-1938	0.14
E Minnis Bay	1872-1938	0.3

² May V and Heeps C 1985. The nature and rates of change on chalk coastlines. *Zeitschrift fur Geomorphologie*, Supplement Band, 57, 81-94.

³ Dornbusch U and Robinson D, 2005. Retreat of chalk cliffs and downwearing of shore platforms in the Eastern Channel during the last century. *Beaches at Risk Phase 1 Science Report*. Available from: <http://www.geog.susx.ac.uk/BAR/>

Dornbusch U and Robinson D, 2005. Controls on chalk cliff erosion in the Eastern Channel. *Beaches at Risk Phase 1 Science Report*. Available from: <http://www.geog.susx.ac.uk/BAR/>

Dornbusch, U., Robinson, D, Moses, C., Williams, R and Costa, S, 2005. Retreat of Chalk cliffs in the eastern Channel during the last century. *Journal of Maps*, 71-78.

These previous studies give a consistent picture of historical erosion rates, in the range 0.05-0.3m/year. The future Upper Bound projections presented in D'Olier (2007) are very similar to these past rates, 0.05m/year to 0.5m/year, an increase of between 0% and 60%. However, the Lower Bound estimates are significantly lower than the past rates (0.02m/year to 0.15m/year).

A word of caution is needed, however, as D'Olier's future Upper Bound erosion projections do not show a significant acceleration in erosion rate in response to increased rates of RSLR expected over the next 100 years. This is in contrast to many coastal scientists who believe that RSLR will result in an increase in wave energy at the cliff foot and accelerated cliff erosion. For example, Bray and Hooke⁴ (1997) suggested that RSLR could increase cliff recession rates on the south coast of England by 22% to 133% by 2050.

It is concluded that D'Olier's Upper Bound erosion rates provide a reasonable basis for high-level prediction of habitat loss/gain along the shoreline. However, these rates may slightly under-estimate the effects of RSLR.

3 Shore Platform Lowering Rates

D'Olier (2007) does not consider platform lowering rates.

A number of processes are probably involved in the lowering of the shore platform, including:

- the *erosion of individual particles* by the shear stresses associated with breaking waves. Rapid downcutting rates occur where water depth changes rapidly and in front of seawalls where reflected waves concentrate turbulent energy dissipation in shallow water.
- *abrasion* from the movement of sands and gravels across the platform surface.
- *alternating periods of desiccation and wetting* which results in very thin upper layers being cracked into polygons which are then removed by the sea (flaking). This process is probably confined to the intertidal zone.

Previous work on shore platform lowering includes:

- So⁵ (1965) reported that platform lowering rates of 1"/year (0.025m/year) had been observed at Margate and Broadstairs. Surveys for the construction of Broadstairs pier indicated that the chalk level stood in 1904 at 4.5 feet above and in 1961 1 foot below the bottom of the concrete.
- the Beaches at Risk team estimated lowering rates of 0.02m/year, based on a measured 57m LWM retreat across a 2^o platform surface between Ramsgate and Palm Bay.

It is concluded that lowering rates of at least 0.02m/year can be expected across the inter-tidal sections of the shore platform on the protected

⁴ Bray, M. J. and Hooke, J.M., 1997. Prediction of soft-cliff retreat with accelerating sea-level rise. *Journal of Coastal Research*, 13, 2, 453-467.

⁵ So C L 1965. Coastal platforms of the Isle of Thanet. *Transactions of the Institute of British Geographers*, 37, 147-156.

shoreline. A key factor is likely to be the turbulent flows associated with waves reflected from the seawall face. Lower rates might be expected on the unprotected shoreline where seawalls are not present, possibly around 0.01m/year. However, it is not clear whether these rates will be significantly modified by RSLR.

4 Habitat Loss and Gain: Appropriate Assessment Estimates

Figure 2 presents a simple habitat loss/gain model for the chalk reef habitats and identifies 4 main habitat change scenarios:

1. Loss of littoral and corresponding gain of sub-littoral habitat due to the combined effects of RSLR and shore platform lowering i.e. the inter-tidal platform is progressively submerged by rising sea-level (a form of *coastal squeeze*). This occurs on both the protected and unprotected coast and is applicable under both “No Active Intervention” and “Hold the Line” policy options.
2. Gain of littoral habitat on the unprotected cliffline due to ongoing cliff erosion (applicable under a “No Active Intervention” policy option).
3. Gain of littoral habitat on the currently protected cliffline due to failure of the coastal defences and renewal of cliff erosion (applicable under a “No Active Intervention” policy option).
4. “Prevented Gain”; holding the existing defence line prevents cliff erosion and the formation of new littoral shore platform (applicable under a “Hold the Line” policy option).

Note that throughout the subsequent review and analysis, I have assumed that there is no loss of sub-littoral habitat at the seaward edge of the submerged shore platform.

The Appropriate Assessment report states that a HTL policy will “*accelerate the process of coastal squeeze (i.e. scenario 1), causing narrowing of inter-tidal areas as sea levels rise. This is especially significant along the Isle of Thanet coastline, which is characterised by chalk reefs. Without a regular supply of material from eroding chalk cliffs, the reef will be significantly affected by sea-level rise (i.e. scenario 4)*”.

Only 2 habitat change scenarios are evaluated in the Appropriate Assessment: on-going cliff retreat on the unprotected coast (i.e. scenario 2; “actual erosion”) and the prevention of gain on of the currently protected coast (i.e. scenario 4 “potential erosion”). Combined, these two estimates yield the “total erosion” that would occur if the entire coastline was actively retreating.

Table 3 Summary of the Appropriate Assessment predictions of habitat prevented gain (red) and gain (blue) and net change (- indicates net loss). From Table 7 of the Appropriate Assessment (Page J18)

	0-20 Years	20-50 Years	50-100 Years
Actual Erosion Scenario 2	1.4	3.69	8.77
Total Erosion Scenarios 2 and 4	6.25	16.81	32.81
Potential Erosion (Total Erosion – Scenario 4)	-4.85	-13.13	-24.04

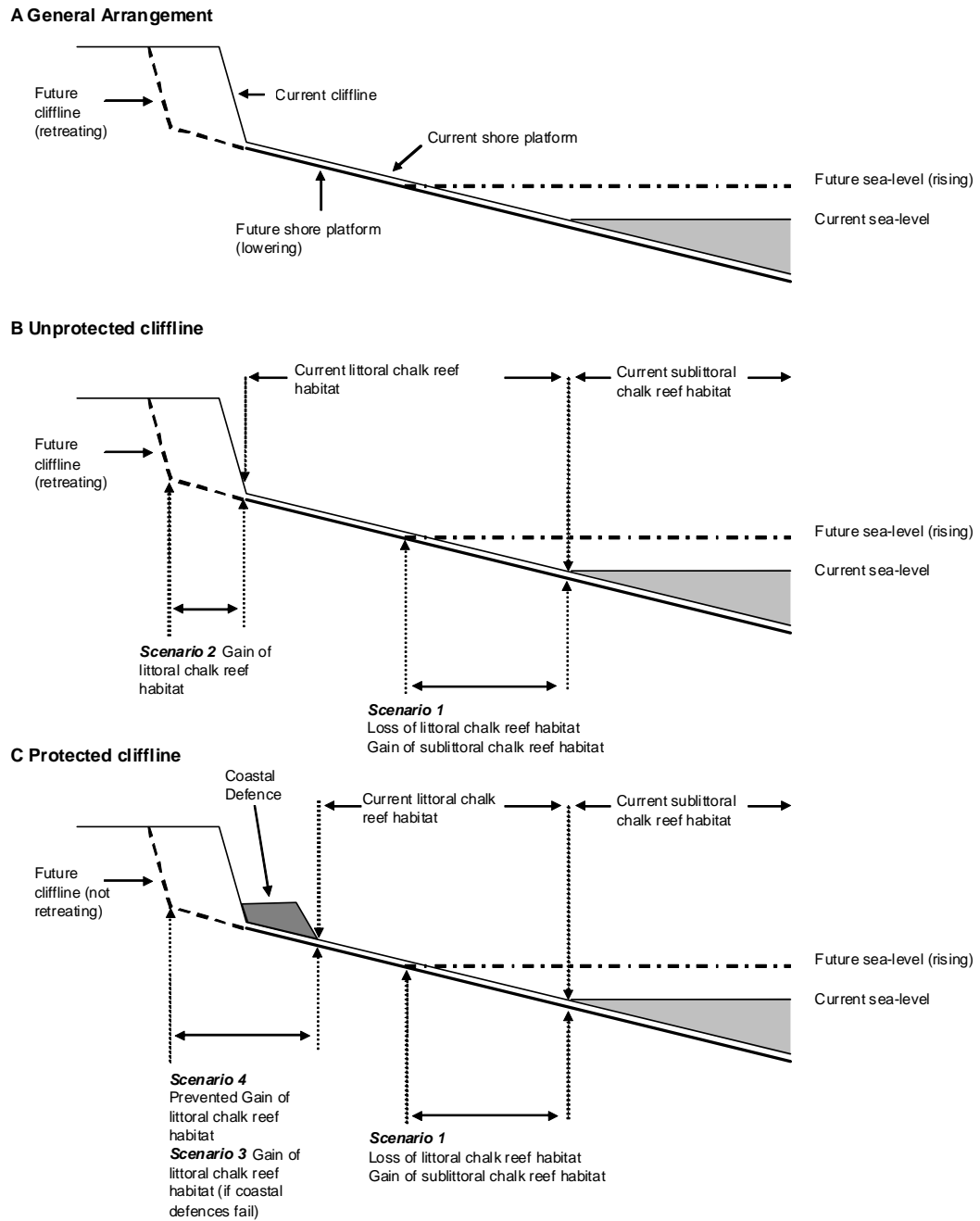


Figure 2 Simple habitat change model (note gradient of shore platform and sea-level rise are exaggerated)

The following changes are predicted at the 21 cliff sectors, over a 100 year period (Table 3):

- actual erosion (scenario 2); a gain of 8.77 ha of littoral reef on the unprotected coast;
- potential erosion (scenarios 2 and 4 combined); a potential gain of 32.8ha of littoral reef on the protected and unprotected coast;
- a net “loss” of 24ha of littoral reef associated with “prevented gain”.

5 Review of Appropriate Assessment Estimates

I have tried to reproduce the estimates in Table 3 (and Table 7 of the Appropriate Assessment), using:

- the upper bound cliff erosion projections for each cliff sector from D'Olier (2007)
- the cliff sector lengths provided by Andy Jeffery of Canterbury CC.

My estimates are presented in Table A.2 (Appendix A) and summarised in Table 4. This suggests that the balance between total erosion and actual erosion (i.e. prevented gain) may be lower than previously suggested, around 11ha over 100 years.

Table 4 Revised summary of the Appropriate Assessment predictions of habitat prevented gain (red) and gain (blue) and net change (- indicates net loss).

	0-20 Years	20-50 Years	50-100 Years
Actual Erosion Scenario 2	2.64	6.28	15.49
Total Erosion Scenarios 2 and 4	4.90	14.11	26.41
Potential Erosion (Total Erosion – Scenario 4)	-2.26	-7.83	-10.92

A number of points are worth making:

- normally the impacts of a HTL policy would be compared against a the changes that would take place under a “No Active Intervention” policy i.e. what would happen if we carry on “doing something” compared with what would happen if we “do nothing”.
- in essence, the Appropriate Assessment compares what would happen if we carry on “doing something” with what would happen if we pretend the defences did not exist. The prevented gain estimates in the Appropriate Assessment are based on the immediate loss and removal of the coastal defences i.e. the defences fail in Year 0 and do not offer any further protection to the clifflines which immediately start to retreat. This is an artificial construct and not the equivalent of a “No Active Intervention” scenario under which the defences would gradually deteriorate until failure at some point in the future. Even after failure the defences would continue to provide some degree of protection to the cliffline.
- the Appropriate Assessment indicates that there would be a gain of 8.77ha of habitat under the actual erosion (i.e. “No Active Intervention”) scenario. However, this only considers gains on the unprotected cliffline, and ignores the potential for any possible gains on the currently protected clifflines once the defences fail at the end of their residual life.
- the littoral and sub-littoral habitat changes caused by the progressive submergence of the platform on the protected cliffline under a “Hold the Line” scenario have not been estimated in the Appropriate Assessment (scenario 1).

It is concluded that the Appropriate Assessment does not provide a reliable estimate of the habitat losses and gains associated with different SMP2 policy options. Caution is needed when interpreting the results, as “prevention of gain” is not the same as actual habitat loss.

6 Habitat Loss and Gain: Alternative Estimates

I have developed a high-level 100-year loss/gain/prevented gain account at the 21 cliff sectors under the 2 different shoreline management scenarios typically evaluated in an SMP2:

- the “No Active Intervention” scenario (NAI). This scenario assumes that there is no expenditure on maintaining or improving defences and that, therefore, defences will fail at a time dependent upon their residual life and the condition of the beaches. Estimates of the residual life of the existing defences are presented in Appendix C of the SMP2 document (Page C-32) and summarised in Table 5. I have made an estimate of the post-failure time to the onset of renewed erosion, based on experience at other sites. Note that in this simple model no account has been taken of the probably decline in shore platform lowering rates after the defences have completely failed.

Table 5 Residual life and time to renewed erosion of current defences (note that residual protection period and time to renewed erosion are assumed values, based on experience at other sites)

Defence Section	Residual Life (Years)	Estimated Residual Protection Period (Years)	Estimated Time to Renewed Erosion (Years)
Minnis Bay - Margate	20	25	45
Margate Harbour	50	25	75
Margate-Foreness Point	20	25	45
Stone Bay-Ramsgate	50	25	75
Ramsgate Harbour	100+		100+
Ramsgate Harbour to Pegwell	50	25	75

- the ‘With Present Management’ scenario (WPM). This considers that all existing defences are maintained in their current condition. It should be noted that maintenance will be necessary to extend the residual life of the structures, and repair will be undertaken to a standard equal to that of today. Elsewhere, unprotected cliffs will continue to erode with no active intervention.

WPM is broadly equivalent to the “Preferred” SMP2 scenario in which the existing defences will be maintained and their condition improved as and when required (i.e. Hold the Line). Elsewhere, unprotected cliffs will continue to erode (i.e. NAI).

The results of the analysis are presented in Tables A.3 and A.4 (see Appendix A) and summarised in Table 6. These figures should not be regarded as being anything other than “ball-park” estimates. However, the results indicate:

- the habitat loss/gain account is dominated by the effects of platform submergence (scenario 1), which could result in the change of over 200ha of littoral reef habitat to sub-littoral habitat. These changes would occur under both NAI and WPM.

Note that these changes have been estimated as follows (see Appendix A):

Platform Length Affected = Water Depth Change/Sine Platform Gradient

Table 6 100-year Habitat Change estimates for different SMP2 scenarios (Negative indicates net loss).

SMP2 Scenario	Habitat Change Scenario	Inter-tidal Gain (ha)	Inter-tidal Loss (ha)	Inter-tidal Change (ha)	Inter-tidal Prevented Gain (ha)	Sub-tidal Gain (ha)
No Active Intervention	Scenario 1	0	212	-212	0	212
	Scenario 2	15	0	15	0	0
	Scenario 3	10	0	10	0	0
	TOTAL	25	212	-187	0	212
With Present Management	Scenario 1	0	212	-212	0	212
	Scenario 2	15	0	15	0	0
	Scenario 3	0	0	0	10	0
	TOTAL	15	212	-197	10	212

The water depth change is the sum of the predicted RSLR (1m; based on Defra⁶ (2006) guidance) and platform lowering (2m on the protected coast).

Platform Area Affected = Platform Length Affected x Sector Length

- the on-going erosion of the unprotected cliffs would deliver around 15ha of littoral habitat gains under both NAI and WPM (scenario 2).
- the renewed erosion of the currently protected cliffline would deliver around 10ha of littoral habitat under a NAI policy. The same area can be considered “prevented gain” under the WPM policy.

It is concluded that by focussing on “prevented gain” and ignoring the effects of “platform submergence”, the Appropriate Assessment provides an incomplete picture of the habitat losses and gains associated with different SMP2 policy options.

7 Sensitivity to RSLR Scenarios

The estimates presented in Table 6 are based on a RSLR scenario that is consistent with the current Defra allowances for coastal defence design. This allowance is broadly consistent with the UKCIP⁷ high emissions scenario, which predicts a 0.77m chance by 2080. However, their low emissions scenario would result in 0.17m chance by 2080.

Table 7 presents a re-run of the habitat change analysis using the UKCIP low emissions scenario, with an overall RSLR of 0.25m over the next 100 years. This suggests that the changes associated with submergence could be around 25% lower than under the high emission scenario (note that platform lowering rates have not been modified in this analysis).

⁶ Defra, 2006. Flood and coastal defence appraisal guidance. FCDPAG3 Economic appraisal, Supplementary note to operating authorities- Climate change impacts

⁷ UKCIP 2006. Updates to regional net sea level change estimates for Great Britain. August 2006.

Table 7 Low Emissions RSLR scenario: 100-year Habitat Change estimates for different SMP2 scenarios (Negative indicates net loss).

SMP2 Scenario	Habitat Change Scenario	Inter-tidal Gain (ha)	Inter-tidal Loss (ha)	Inter-tidal Change (ha)	Inter-tidal Prevented Gain (ha)	Sub-tidal Gain (ha)
No Active Intervention	Scenario 1	0	155	-155	0	155
	Scenario 2	15	0	15	0	0
	Scenario 3	10	0	10	0	0
	TOTAL	25	155	-130	0	155
With Present Management	Scenario 1	0	155	-155	0	155
	Scenario 2	15	0	15	0	0
	Scenario 3	0	0	0	10	0
	TOTAL	15	212	-140	10	155

8 Specific Questions

1. *will Hold the Line policies increase reflected wave energy and so increase the rate of lowering of the shore platform?*

Yes, it is likely that shore platform lowering rates on the currently protected coast will increase as RSL rises. However, it is not possible to provide a reliable estimate as to how much increase could be expected.

2. *what cliff erosion and shore platform lowering rates can be expected in the future?*

Future cliff erosion rates are likely to be similar to the Upper Bound estimates made by D'Olier (2007).

Previous studies suggest that shore platform lowering rates have been around 0.02m/year for protected clifflines. Rates are likely to be lower on unprotected sections of coast (say, around 0.01m/year). These rates will probably increase over the next 100 years.

3. *what habitats loss/gain might be expected over the SMP2 time period (100 years) under different shoreline management scenarios?*

See the results in Table 6.

4. *is the loss of chalk reef from HTL policies significant compared with "natural change"?*

For the WPM scenario (i.e. HTL on the protected coast and NAI on the unprotected coast), future habitat loss/gain is likely to be dominated by the effects of coastal squeeze which could result in the loss of over 200ha of littoral habitat over the next 100 years. There would be corresponding sub-littoral habitat gains.

"Prevented gain" of littoral habitat is likely to represent <10% of the changes resulting from coastal squeeze.

“Natural change” (as used in the Appropriate Assessment) is an artificial construct, based on the assumption that the existing defences will be lost overnight. It would result in higher “prevented gain” figures, possibly in the order of 25ha (see Table 4).

9 Concluding Remarks

Over the next 100 years the chalk reefs on the Thanet coast will be affected by 4 main habitat change scenarios:

1. Loss of littoral and corresponding gain of sub-littoral habitat due to platform submergence caused by the combined effects of relative sea-level rise (RSLR) and shore platform lowering (a form of *coastal squeeze*; applicable under both “No Active Intervention” and “Hold the Line” policy options).
2. Gain of littoral habitat on the unprotected cliffline due to ongoing cliff erosion (applicable under a “No Active Intervention” policy option).
3. Gain of littoral habitat on the currently protected cliffline due to failure of the coastal defences and renewal of cliff erosion (applicable under a “No Active Intervention” policy option).
4. “Prevented Gain”; holding the existing defence line prevents cliff erosion and the formation of new littoral shore platform (applicable under a “Hold the Line” policy option).

The Appropriate Assessment report prepared for the SMP2 focuses on scenarios 2 and 4 and does not consider the habitat changes associated with coastal squeeze (scenario 1). The assessment compares the preferred SMP2 policy with a “natural change” scenario in which the existing defences are assumed to be not in place. This is an artificial construct and does not reflect the reality where, in a No Active Intervention scenario, the defences would fail at the end of their residual life and continue to provide some protection.

In a high-level analysis undertaken for this report, the 100-year habitat loss/gain account is dominated by the effects of platform submergence (scenario 1), which could result in the change of over 200ha of littoral reef habitat to sub-littoral habitat. However, the scale of these changes is sensitive to future RSLR scenarios and shore platform lowering rates.

The on-going erosion of the unprotected cliffs would deliver around 15ha of littoral habitat gains (scenario 2). The renewed erosion of the currently protected cliffline would deliver around 10ha of littoral habitat under a No Active Intervention policy. The same area can be considered “prevented gain” under a With Present Management policy.

Appendix A: Large Tables

This Appendix contains the following Tables:

A.1; a summary of the predicted erosion distances and average annual rates, based on the data presented in (D'Olier, 2007);

A.2; my analysis of the Appropriate Assessment habitat change assessment (a revision of Table 7 from the Appropriate Assessment report). The input data is as follows:

- Column 2 (coastal defences), based on the descriptions in D'Olier (2007);
- Column 3 (length), based on data supplied by Andy Jeffery;
- Columns 4 to 6 (erosion rates), these are the upper bound erosion rates from Table A.1. Note that there are sectors where no erosion is expected (as stated in D'Olier, 2007);
- Columns 7 to 9 (habitat change), calculated as:
$$(\text{Erosion Rate (m/year)} \times \text{Sector Length (m)}) / 10,000$$

A.3; my high-level habitat change analysis for the No Active Intervention scenario. The input data and calculations are as follows:

- Scenario 1, Platform gradient (degrees) taken from Dornbusch and Robinson⁸ (Page 11).
- Scenario 1, Platform lowering. Lowering rates are assumed to be 0.02m/year on the protected coast and 0.01m/year on the unprotected coast (as discussed in Section 3 of this report).
- Scenario 1, RSLR, based on Defra⁹ (2006) guidance and rounded-up to 1m/century.
- Scenario 1, the change in platform elevation relative to sea-level is the sum of platform lowering and RSLR.
- Scenario 1, Inter-tidal loss (m) is calculated as follows:
$$\text{Change in Platform Elevation (m)} / \text{Sine Platform Gradient}$$
- Scenario 1, inter-tidal loss (ha) calculated as:
$$\text{Inter-tidal loss (m)} \times \text{Sector Length (m)} / 10,000$$
- Scenario 1, sub-tidal gain is assumed to be the equivalent of the inter-tidal loss.
- Scenario 2, cliff erosion distances are the upper-bound 100 year estimates for unprotected cliff sectors (from Table A.1).
- Scenario 2, inter-tidal gain (m) is assumed to be the equivalent of the cliff erosion distance.

⁸ Dornbusch U and Robinson D, 2005. Retreat of chalk cliffs and downwearing of shore platforms in the Eastern Channel during the last century. Beaches at Risk Phase 1 Science Report.

⁹ Defra, 2006. Flood and coastal defence appraisal guidance. FCDPAG3 Economic appraisal, Supplementary note to operating authorities- Climate change impacts

- Scenario 2, inter-tidal gain (ha) calculated as:
Inter-tidal gain (m) x Sector Length (m) / 10,000
- Scenario 3, year to renewed erosion taken from Table 5.
- Scenario 3, erosion rate is the upper bound estimate for the period 50-100 years from Table A.1.
- Scenario 3, erosion distance is calculated as:
Erosion rate x (100 – Year to Renewed Erosion)
- Scenario 3, inter-tidal gain (ha) calculated as:
Erosion Distance (m) x Sector Length (m) / 10,000

A.4; my high-level habitat change analysis for the With Present Management scenario. The input data and calculations are as for Table A.3.

Table A.1 Summary of predicted erosion distances and average annual rates (based on data in D'Olier, 2007)

Sector	Location	Coastal Defences	Sector Length (km)	LOWER BOUND ESTIMATE						UPPER BOUND ESTIMATE						
				Cumulative Erosion			Average Annual Erosion Rate (m/year)			Cumulative Erosion			Average Annual Erosion Rate (m/year)			
				Year 20	Year 50	Year 100	Year 0-20	Year 20-50	Year 50-100	Year 20	Year 50	Year 100	Year 0-20	Year 20-50	Year 50-100	
1	Old Hoverport to Little Cliffsend	Unprotected	0.17		1	2		0.02	0.02		1	3	6	0.05	0.06	0.06
2	Cliffsend to Pegwell Village	Unprotected	0.68	2	5	12.5	0.1	0.1	0.12	7	15	35	0.35	0.3	0.35	
3	Pegwell to Western Undercliffe	Protected	0.62	2	4	7	0.1	0.08	0.07	5	10	18	0.25	0.2	0.18	
4	W. Undercliffe to Ramsagte (N)	Protected	3.24													
5	Ramsagte (N) to Winterstoke (N)	Protected	0.87	1	2	3.5	0.05	0.04	0.03	2.5	5	8	0.12	0.1	0.08	
6	Winterstoke (N) to Dumpton Gap	Unprotected	0.59	3	5	15	0.15	0.1	0.15	7	20	50	0.35	0.4	0.5	
7	Dumpton Gap to Louisa Bay	Protected	1.00	1	2	3.5	0.05	0.04	0.03	2.5	5	8	0.12	0.1	0.08	
8	Louisa Bay to Bleak House	Protected	0.86													
9	Bleak House to Stone Bay	Protected	0.72	1	2	3.5	0.05	0.04	0.03	2.5	5	8	0.12	0.1	0.08	
10	Stone Bay to defence end (N)	Unprotected	0.30	1.5	3	5	0.07	0.06	0.05	3.5	7	12.5	0.17	0.14	0.12	
11	Defence end to Loss Bay	Unprotected	1.60	1	2	3.5	0.05	0.04	0.03	2.5	4.5	12	0.12	0.09	0.12	
12	Joss Bay to Captain Digby Inn	Protected	0.42	1	2	3.5	0.05	0.04	0.03	2.5	4.5	12	0.12	0.09	0.12	
13	Captain Digby Inn to Botany Bay	Unprotected	1.33	2	4	12	0.1	0.08	0.12	6	15	40	0.3	0.3	0.4	
14	Botany Bay to Foreness Point	Unprotected	0.55	1	1.5	3	0.05	0.03	0.03	2	4	7	0.1	0.08	0.07	
14b	Foreness Point	Unprotected	0.50	2	3.5	10	0.1	0.07	0.1	5	12	30	0.25	0.24	0.3	
15	Foreness Point to Fort Hill	Protected	3.20	1	1.5	5	0.05	0.03	0.05	2	7.5	15	0.1	0.15	0.15	
16	Margate Harbour	Protected	1.24													
17	Margate to Westbrook Bay (W)	Protected	1.29	1	2	5	0.05	0.04	0.05	3	9	17	0.15	0.18	0.17	
18	Westbrook Bay (W) to Westgate Golf	Protected	3.15	1	1.5	5	0.05	0.03	0.05	2	7.5	15	0.1	0.15	0.15	
19	Westgate Golf to Epple Bay	Unprotected	0.40	1	1.5	5	0.05	0.03	0.05	2	7.5	15	0.1	0.15	0.15	
20	Epple Bay to Minnis Bay	Protected	4.03	1	2	5	0.05	0.04	0.05	3	9	17	0.15	0.18	0.17	

Note: Blank cells indicate no predicted erosion

Table A.2 Revised analysis of habitat change at cliff sectors.

	Coastal Defences	Length (m)	Erosion Year 20	Erosion Year 50	Erosion Year 100	Habitat Change (ha)		
1	Unprotected	166	1	3	6	0.02	0.05	0.10
2	Unprotected	681	7	15	35	0.48	1.02	2.38
3	Protected	624	5	10	18	0.31	0.62	1.12
4	Protected	3239				0.62	1.25	2.17
5	Protected	872	2.5	5	8	0.22	0.44	0.70
6	Unprotected	588	7	20	50	0.41	1.18	2.94
7	Protected	1002	2.5	5	8	0.25	0.50	0.80
8	Protected	857				0.23	0.45	0.72
9	Protected	720	2.5	5	8	0.18	0.36	0.58
10	Unprotected	300	3.5	7	12.5	0.10	0.21	0.37
11	Unprotected	1599	2.5	4.5	12	0.40	0.72	1.92
12	Protected	420	2.5	4.5	12	0.11	0.19	0.50
13	Unprotected	1326	6	15	40	0.80	1.99	5.30
14a	Unprotected	545	2	4	7	0.11	0.22	0.38
14b	Unprotected	497	5	12	30	0.25	0.60	1.49
15	Protected	3200	2	7.5	15	0.64	2.40	4.80
16	Protected	1244				0.12	0.75	1.25
17	Protected	1288	3	9	17	0.39	1.16	2.19
18	Protected	3150	2	7.5	15	0.63	2.36	4.73
19	Unprotected	398	2	7.5	15	0.08	0.30	0.60
20	Protected	4031	3	9	17	1.21	3.63	6.85

Note: grey cells indicate sections where it has not been possible to revise the Appropriate Assessment calculations. I have simply used the relevant figures from Table 7 of the Appropriate Assessment.

Table A.3 Habitat Change: No Active Intervention

SCENARIO:

No active intervention (existing defences fail at the end of their residual life)

Section	Coastal Defences	Length (m)	Scenario 1: 100 Year Change						
			Platform Gradient (Degrees)	Platform Lowering (m)	RSLR (m)	Total Relative Lowering (m)	Inter-tidal Loss (m)	Inter-tidal Loss (ha)	Sub-tidal Gain (ha)
1	Unprotected	166	2	1	1	2	57.3	0.95	0.95
2	Unprotected	681	2	1	1	2	57.3	3.90	3.90
3	Protected	624	2	2	1	3	86.0	5.36	5.36
4	Protected	3239	2	2	1	3	86.0	27.84	27.84
5	Protected	872	2	2	1	3	86.0	7.50	7.50
6	Unprotected	588	2	1	1	2	57.3	3.37	3.37
7	Protected	1002	2	2	1	3	86.0	8.61	8.61
8	Protected	857	2	2	1	3	86.0	7.37	7.37
9	Protected	720	2	2	1	3	86.0	6.19	6.19
10	Unprotected	300	2	1	1	2	57.3	1.72	1.72
11	Unprotected	1599	2	1	1	2	57.3	9.16	9.16
12	Protected	420	2	2	1	3	86.0	3.61	3.61
13	Unprotected	1326	2	1	1	2	57.3	7.60	7.60
14a	Unprotected	545	2	1	1	2	57.3	3.13	3.13
14b	Unprotected	497	2	1	1	2	57.3	2.85	2.85
15	Protected	3200	2	2	1	3	86.0	27.51	27.51
16	Protected	1244	2	2	1	3	86.0	10.69	10.69
17	Protected	1288	2	2	1	3	86.0	11.07	11.07
18	Protected	3150	2	2	1	3	86.0	27.08	27.08
19	Unprotected	398	2	1	1	2	57.3	2.28	2.28
20	Protected	4031	2	2	1	3	86.0	34.65	34.65

TOTAL 212.44 212.44

Section	Coastal Defences	Length (m)	Scenario 2: 100 Year Change			Scenario 3: 100 Year Change			
			Cliff Erosion (m)	Inter-tidal Gain (m)	Inter-tidal Gain (ha)	Year to Renewed Erosion	Erosion Rate (m/year)	Erosion Distance (m)	Inter-tidal Gain (ha)
1	Unprotected	166	6	6	0.10				
2	Unprotected	681	35	35	2.38				
3	Protected	624		0	0.00	75	0.18	4.50	0.28
4	Protected	3239		0	0.00	100+			
5	Protected	872		0	0.00	75	0.08	2.00	0.17
6	Unprotected	588	50	50	2.94				
7	Protected	1002		0	0.00	75	0.08	2.00	0.20
8	Protected	857		0	0.00	75			
9	Protected	720		0	0.00	75	0.08	2.00	0.14
10	Unprotected	300	12.5	12.5	0.37				
11	Unprotected	1599	12	12	1.92				
12	Protected	420		0	0.00	75	0.12	3.00	0.13
13	Unprotected	1326	40	40	5.30				
14a	Unprotected	545	7	7	0.38				
14b	Unprotected	497	30	30	1.49				
15	Protected	3200		0	0.00	75	0.15	3.75	1.20
16	Protected	1244		0	0.00	100+			
17	Protected	1288		0	0.00	45	0.17	9.35	1.20
18	Protected	3150		0	0.00	45	0.15	8.25	2.60
19	Unprotected	398	15	15	0.60				
20	Protected	4031		0	0.00	45	0.17	9.35	3.77

TOTAL 15.49

TOTAL 9.70

	Inter-tidal Gain (ha)	Inter-tidal Loss (ha)	Inter-tidal Change (ha)	Inter-tidal Prevented Gain (ha)	Sub-tidal Gain (ha)
Scenario 1	0	212	-212	0	212
Scenario 2	15	0	15	0	0
Scenario 3	10	0	10	0	0
TOTAL	25	212	-187	0	212

Table A.4 Habitat Change: With Present Management

SCENARIO:

With Present Management (existing defences maintained to current standard)

Section	Coastal Defences	Length (m)	Scenario 1: 100 Year Change						
			Platform Gradient (Degrees)	Platform Lowering (m)	RSLR (m)	Total Relative Lowering (m)	Inter-tidal Loss (m)	Inter-tidal Loss (ha)	Sub-tidal Gain (ha)
1	Unprotected	166	2	1	1	2	57.3	0.95	0.95
2	Unprotected	681	2	1	1	2	57.3	3.90	3.90
3	Protected	624	2	2	1	3	86.0	5.36	5.36
4	Protected	3239	2	2	1	3	86.0	27.84	27.84
5	Protected	872	2	2	1	3	86.0	7.50	7.50
6	Unprotected	588	2	1	1	2	57.3	3.37	3.37
7	Protected	1002	2	2	1	3	86.0	8.61	8.61
8	Protected	857	2	2	1	3	86.0	7.37	7.37
9	Protected	720	2	2	1	3	86.0	6.19	6.19
10	Unprotected	300	2	1	1	2	57.3	1.72	1.72
11	Unprotected	1599	2	1	1	2	57.3	9.16	9.16
12	Protected	420	2	2	1	3	86.0	3.61	3.61
13	Unprotected	1326	2	1	1	2	57.3	7.60	7.60
14a	Unprotected	545	2	1	1	2	57.3	3.13	3.13
14b	Unprotected	497	2	1	1	2	57.3	2.85	2.85
15	Protected	3200	2	2	1	3	86.0	27.51	27.51
16	Protected	1244	2	2	1	3	86.0	10.69	10.69
17	Protected	1288	2	2	1	3	86.0	11.07	11.07
18	Protected	3150	2	2	1	3	86.0	27.08	27.08
19	Unprotected	398	2	1	1	2	57.3	2.28	2.28
20	Protected	4031	2	2	1	3	86.0	34.65	34.65

TOTAL 212.44 212.44

Section	Coastal Defences	Length (m)	Scenario 2: 100 Year Change			Scenario 3: 100 Year Change			
			Cliff Erosion (m)	Inter-tidal Gain (m)	Inter-tidal Gain (ha)	Year to Renewed Erosion	Erosion Rate (m/year)	Erosion Distance (m)	Inter-tidal Prevented Gain (ha)
1	Unprotected	166	6	6	0.10				
2	Unprotected	681	35	35	2.38				
3	Protected	624		0	0.00	75	0.18	4.50	0.28
4	Protected	3239		0	0.00	100+			
5	Protected	872		0	0.00	75	0.08	2.00	0.17
6	Unprotected	588	50	50	2.94				
7	Protected	1002		0	0.00	75	0.08	2.00	0.20
8	Protected	857		0	0.00	75			
9	Protected	720		0	0.00	75	0.08	2.00	0.14
10	Unprotected	300	12.5	12.5	0.37				
11	Unprotected	1599	12	12	1.92				
12	Protected	420		0	0.00	75	0.12	3.00	0.13
13	Unprotected	1326	40	40	5.30				
14a	Unprotected	545	7	7	0.38				
14b	Unprotected	497	30	30	1.49				
15	Protected	3200		0	0.00	75	0.15	3.75	1.20
16	Protected	1244		0	0.00	100+			
17	Protected	1288		0	0.00	45	0.17	9.35	1.20
18	Protected	3150		0	0.00	45	0.15	8.25	2.60
19	Unprotected	398	15	15	0.60				
20	Protected	4031		0	0.00	45	0.17	9.35	3.77

TOTAL 15.49 TOTAL 9.70

	Inter-tidal Gain (ha)	Inter-tidal Loss (ha)	Inter-tidal Change (ha)	Inter-tidal Prevented Gain (ha)	Sub-tidal Gain (ha)
Scenario 1	0	212	-212	0	212
Scenario 2	15	0	15	0	0
Scenario 3	0	0	0	10	0
TOTAL	15	212	-197	10	212

Appendix J:

DEFRA Approval Letter

Zone 1/06, Temple Quay House
2 The Square
Temple Quay
Bristol BS1 6EB

Telephone

Website www.defra.gov.uk



Andy Jeffery
Strategic Regional Coastal Monitoring
Canterbury City Council
Military Road
Kent
CT1 1YW



Our ref NSSS46

27 November 2009

Dear Mr Jeffery

ISLE OF GRAIN TO SOUTH FORELAND SHORELINE MANAGEMENT PLAN

1. Thank you for supplying the Habitats Regulations Assessment and the completed Appendix 20 application for the Isle of Grain to South Foreland Shoreline Management Plan (SMP).
2. I recognise that Canterbury City Council has fulfilled its obligations under the Habitats Regulations and appropriately assessed the impacts of the proposed SMP on the European sites affected.
3. I am satisfied that you have carried out a thorough evaluation of alternative solutions. I accept that there are no alternative solutions to the preferred options that would have a lesser effect on the integrity of the European sites.
4. Given the current flood risk to residential and commercial properties, ports, power stations and other key infrastructure, I consider that you have made a compelling case to justify the potential damage on grounds of imperative reasons of overriding public interest.
5. I am satisfied that sufficient compensatory habitat has been secured through the Environment Agency's Southern Regional Habitat Creation Programme to ensure that the overall coherence of the Natura 2000 network is protected.
6. Consequently, I can confirm that Defra has no objections to the Canterbury City Council's intention to approve this SMP.
7. I would be grateful if you could inform Craig Lee once the Strategy is approved so that he can forward the details to the European Commission.
8. I am copying this letter to Paul Murby in Defra and Ingrid Chudleigh in Natural

England.

Yours sincerely



Steve Lee-Bapty
Head of Protected Areas
Acting on behalf of the Secretary of State
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Email steve.lee-bapty@defra.gsi.gov.uk