

# Coastal Change Adaptation Planning Guidance

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East Riding of Yorkshire Council

June 2013

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# Coastal Change Adaptation Planning Guidance

## East Riding of Yorkshire Council

June 2013

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## Document history

### Coastal Change Adaptation Planning Guidance

Services to develop a coastal change adaptation planning guide

East Riding of Yorkshire Council (ERYC)

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## Contents

<b>Executive Summary</b>	<b>i</b>
<b>Glossary</b>	<b>iii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Background	1
1.2 The purpose of this guide	1
1.3 Coastal Change	2
1.4 Coastal Change Management Areas (CCMAs)	3
1.5 CCMAs and planning policy	4
<b>2 Identifying CCMAs</b>	<b>6</b>
2.1 A staged approach for identifying CCMAs	6
2.2 Stage 1: Reviewing SMP policies	7
2.3 Stage 2: Identifying Risk	8
2.3.1 Setting of the coast	8
2.3.2 Factors influencing coastal change risk	13
2.4 Stage 3: Mapping areas of risk	17
2.4.1 Erosion risk mapping	22
2.4.2 Flood risk mapping	22
2.4.3 Climate change and sea level rise	22
2.4.4 Consultation	23
<b>3 Delivering Adaptation through Planning</b>	<b>24</b>
3.1 Adaptation approaches	24
3.1.1 Developing locally-specific adaptation approaches	26
3.1.2 Administration and strategic levels	33
3.2 A planning response to adaptation	35
3.2.1 Planning policy examples	35
3.2.2 Development management considerations	42
<b>4 Key Questions in Aiding Development of CCMAs through the Staged Process</b>	<b>46</b>
4.1.1 Stage 1: Reviewing SMP Policies	46
4.1.2 Stage 2: Identifying Risk	46
4.1.3 Stage 3: Mapping Areas of Risk	47
4.1.4 Stage 4: Delivering Adaptation through Planning	48

## Appendices

### Appendix A Case Studies

#### Figures

Figure 1	Land Use and Spatial Planning Context .....	2
Figure 2	Flow diagram setting out the staged approach to developing CCMA's .....	6
Figure 3	Different Levels of Environmental Designations .....	11
Figure 4	Types of coastal cliff system (from Environment Agency, 2010) .....	16
Figure 5	Example of erosion risk zones covering different time-periods within a CCMA based on similar approach taken to mapping in SMP2s. ....	18
Figure 6	Example of mapping areas of 'imminent', 'higher' and 'lower' risk of cliff erosion (based on mapping from East Riding of Yorkshire Council). ....	19
Figure 7	Example of coastal risk zone mapping based upon detailed understanding of land instability (courtesy: West Dorset District Council). ....	20
Figure 8	Example of mapping potential coastal change zone in areas where the SMP policy is for managed realignment but for which no detailed study has yet been completed. (courtesy: West Dorset District Council). ....	21
Figure 9	Initial guide to potential sources of funding. ....	29

#### Tables

Table 1	Examples of different types of coastal setting in which CCMA's may need to be developed .....	9
Table 2	Matrix of adaptation approaches suitable to different physical coastal settings .....	25
Table 3	Types of communities .....	30
Table 4	Example target and indicator for monitoring planning policy that should be tailored to specific local policy .....	40
Table 5	Development management considerations .....	43

### Executive Summary

Coastal change is an ongoing physical change to the shoreline, involving coastal erosion, coastal landslip, permanent inundation and coastal accretion. Coastal change can, and does, pose a threat to coastal communities, infrastructure, heritage, habitats and wildlife, including complete loss of homes and land.

In the future there will be a need to adapt to predicted or planned coastal change. This is particularly the case in areas where the Shoreline Management Plan (SMP) policy is to change from a state of present defence (Hold the Line) to one of realigned defences (Managed Realignment) or no defences at all (No Active Intervention). Adaptation will also be required in undefended areas where erosion or flood risks are increasing or are expected to increase due to both natural ongoing coastal change and the impacts of climate change. As such there is a need to begin pro-actively planning and managing the future change so that the risks to people, property, infrastructure and the environment are reduced.

In England, the Government's Department for Environment, Food and Rural Affairs (Defra) has been leading a Coastal Change Pathfinder (CCP) programme to explore new ways of adapting to coastal change. Under this programme, 15 projects were delivered between 2009 and 2011 by English local authorities working in partnership with their communities, to trial innovative approaches to planning for and managing coastal change. This guide on planning approaches to coastal change adaptation has been developed to share and build on these outcomes and identify successful approaches from non-CCP authorities.

This document provides specific Coastal Change Adaptation Planning Guidance (CCAPG) for coastal managers, engineers, planners and professionals involved in managing coastal change and implementing the National Planning Policy Framework (NPPF) in coastal areas. It will also be a useful reference document for coastal communities, increasing their understanding of risk, adaptation and how to get involved. It has been designed to aid the identification and delivery of Coastal Change Management Areas (CCMAs) and the development of suitable adaptation approaches within the CCMAs, in line with requirements of the NPPF. This is to be achieved through application of a four-staged approach as presented in this guidance as follows:

- Stage 1: Reviewing SMP Policies
- Stage 2: Identifying Risk
- Stage 3: Mapping Areas of Risk
- Stage 4: Delivering Adaptation through Planning

**Section 1** of the guidance provides the context and policy framework within which coastal change adaptation planning occurs. **Section 2** deals with the identification of CCMAs through Stages 1 to 3, and **Section 3** discusses delivering adaptation through planning policy and development management (Stage 4). **Section 4** of this guidance concludes with a series of key questions to consider during each of the four stages to lead local authorities through the four-staged approach to help them in developing CCMAs; questions that are also highlighted throughout Sections 2 and 3.

Case studies are included throughout, with full information of each provided in **Appendix A**.

## Glossary

Term	Definition
Accretion	Accumulation of sediment due to the natural action of waves, currents and wind.
Adaptation	The process of becoming adjusted to new conditions, in a way that makes individuals, communities or systems better suited to their environment.
Advance the Line (ATL)	Advance the Line. A Shoreline Management Plan policy to build new defences on the seaward side of the existing defence line to reclaim land.
Beach recharge (nourishment)	Artificial process of replenishing a beach with material from another source.
Coastal Change	Physical change to the shoreline, i.e. erosion, coastal landslip, permanent inundation and coastal accretion.
Coastal Change Management Area (CCMA)	An area identified in Local Plans as likely to be affected by coastal change (physical change to the shoreline through erosion, coastal landslip, permanent inundation or coastal accretion).
Coastal Erosion	A natural process that occurs as a result of waves, tides or currents – in other words, the sea – striking the shore. Sediment or rocks are washed away (but can be a sediment source for elsewhere), and our coastline changes shape as a result.
Coastal Flooding	Where land on the coast not normally covered by water, becomes covered by sea water over and above normal tidal action.
Coastal Squeeze / Coastal Narrowing	A process whereby the area between high and low tide decreases as sea levels rise because the low water line moves towards the land while the high water line is fixed by the presence of flood or coastal defences (or high ground).
Flood and Coastal Erosion Risk Management (FCERM)	Flood and coastal erosion risk management addresses the scientific and engineering issues of rainfall, runoff, rivers and flood inundation, and coastal erosion, as well as the human and socio-economic issues of planning, development and management.
Heritage Asset	A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage asset includes designated heritage assets and assets identified by the local planning authority (including local listing).
Hold the Line (HTL)	Hold the Line. A Shoreline Management Plan policy to maintain or change the level of protection provided by defences in their present location.
Intertidal zone	The zone between the high and low water marks.
Local Plan	The plan for the future development of the local area, drawn up by the local planning authority in consultation with the community. In law this is described as the development plan documents adopted under the Planning and Compulsory Purchase

Act 2004. Current core strategies or other planning policies, which under the regulations would be considered to be development plan documents, form part of the Local Plan. The term includes old policies which have been saved under the 2004 Act.

Managed Realignment  
(MR)

A Shoreline Management Plan policy that allows the shoreline position to move backwards (or forwards) with management to control or limit movement.

iii

<b>Term</b>	<b>Definition</b>
Neighbourhood Plan	A plan prepared by a Parish Council or Neighbourhood Forum for a particular neighbourhood area (made under the Planning and Compulsory Purchase Act 2004).
No Active Intervention (NAI)	A Shoreline Management Plan policy that assumes that existing defences are no longer maintained and will fail over time or undefended frontages will be allowed to evolve naturally.
National Planning Policy Framework (NPPF)	The current national planning policies for England issued by the Department for Communities and Local Government in March 2012.
Partnership Funding	Funding contributions for flood and coastal erosion risk management from beyond traditional flood and coastal erosion risk management budgets (e.g. Flood Defence Grant in Aid (FDGiA); the grant by which government funds its share of the costs of FCERM projects in England).
Preliminary Food Risk Assessment (PFRA)	Produced by Lead Local Flood Authorities in England and Wales, PFRAs are a statutory requirement of the Flood Risk Regulations that implement the requirements of the European Floods Directive.
Strategic Flood Risk Assessment (SFRA)	A requirement of the National Planning Policy Framework is for all local plans to be supported by an SFRA. These are developed in consultation with the Environment Agency and form the basis for preparing appropriate policies for flood risk management for these areas.
Shoreline Management Plan (SMP)	A plan providing a large-scale assessment of the risk to people and to the developed, historic and natural environment associated with coastal processes.
Supplementary Planning Document (SPD)	Documents which add further detail to the policies in the Local Plan. They can be used to provide further guidance for development on specific sites, or on particular issues, such as design. Supplementary planning documents are capable of being a material consideration in planning decisions but are not part of the development plan.

iv

# 1 Introduction

## 1.1 Background

Coastal change is an ongoing physical change to the shoreline that occurs through coastal erosion, coastal accretion, coastal flooding and permanent inundation. Coastal change can, and does, pose a threat to coastal communities, infrastructure, heritage, habitats and wildlife, including complete loss of homes and land.

In the future there will be an increasing need to adapt to the ongoing coastal change, for example in areas where the Shoreline Management Plan (SMP) policy is to change from a state of present defence (Hold the Line) to one of realigned defences (Managed Realignment) or no defences at all (No Active Intervention). In undefended areas already subject to erosion or occasional flooding, adaptation will be required if ongoing coastal change, acceleration of erosion or increasing frequency of flooding due to climate change and sea level rise increases the rate of or risks from coastal change. There is also no right to compensation for damage from flooding or coastal erosion, as coastal defences are provided under permissive powers; there is no statutory duty to provide defences. As such there is a need to begin pro-actively planning and managing adaptation to the future change so that the risks to people, property, infrastructure and the environment are reduced.

In England, the Government's Department for Environment, Food and Rural Affairs (Defra) has been leading the way on coastal change adaptation, including funding of a Coastal Change Pathfinder (CCP) programme as part of a national consultation on the development of a Coastal Change Management Policy. The CCP programme, which was undertaken between 2009 and 2011, explored new ways of adapting to coastal change. Under this programme, 15 projects involving English local authorities working in partnership with their communities trialled innovative approaches to planning for and managing change. To share the lessons learnt from these Pathfinder projects with others dealing with coastal change issues around England, it was proposed that a guide on planning approaches to coastal change adaptation should be developed. This document represents that guide and has been designed to aid the identification and delivery of Coastal Change Management Areas (CCMAs) and suitable adaptation approaches.

## 1.2 The purpose of this guide

It is anticipated the guide will be used by coastal managers, engineers, planners and professionals involved with implementation of CCMAs. The guide should also help coastal communities in increasing their understanding of risk, adaptation and how to get involved. As such, **Section 1** (this Section) provides the context and policy framework within which coastal change adaptation planning occurs. **Section 2** deals

<sup>1</sup> *Coastal Change Pathfinder Review, Final Report*, Department for Environment, Food and Rural Affairs, January 2012. Available online at: <https://www.gov.uk/government/publications/coastal-change-pathfinder-review>.

with the identification of CCMAs, and **Section 3** discusses delivering adaptation through planning policy and development management. **Section 2** and **Section 3** discuss a four-staged approach to CCMA identification and delivery. **Section 4** concludes this guide with key questions to lead local authorities through the four-staged approach to help them in developing CCMAs. Case studies are included throughout, with full information of each provided in **Appendix A**.

This guidance document sits alongside other technical guidance in the English planning system for the development and review of Local and Neighbourhood Plans in guiding coastal adaptation planning policy and decision-making. This is illustrated

in Figure 1.

Figure 1 *Land Use and Spatial Planning Context*

### 1.3 Coastal Change

In the context of this guidance, coastal change is a physical change to the shoreline. It occurs through coastal erosion, coastal landslip, coastal accretion and coastal flooding, particularly where this results in permanent or regular inundation. Coastal change is ongoing on many undefended coasts, but the risks from ongoing change may be increasing or predicted to increase due to ongoing or expected sea level rise and climate change. It can also occur when there is a change in coastal management policy, for example a decision to no longer maintain or replace defences.

Coastal erosion is a wave- and tide-driven process where the action of waves and tides will erode and undercut the base of cliffs, ultimately leading to the landward retreat of the cliff area. Coastal landslides also lead to landwards retreat of the cliff area and can be aided in this process by coastal erosion, although excess groundwater can also trigger coastal landslides. Whilst retreat of the cliff area poses a risk to development and other assets located on top of the cliff, it is important to note that this erosion also provides sediment to the coastal system that can be of benefit to other parts of the coast (and so reduce the risks of coastal change in those areas). The effect of waves and tides at the coast can also cause erosion (or accretion) of beaches, sand dunes, salt marshes and mudflats.

2

Where coastal retreat is prevented by natural or man-made barriers such as resistant cliffs or a seawall, and where there is insufficient input of new sediment (i.e. from cliff erosion or beach recharge), the effect of rising sea levels can result in the erosion or permanent inundation of beaches, sand dunes, salt marshes and mud flats. This process is referred to as coastal squeeze or coastal narrowing and is likely to be increasingly significant as sea levels rise in the future. Where the natural retreat of the coast is not inhibited, rollback of beaches, sand dunes, salt marshes and mudflats can occur as a result of either gradual change or catastrophic change due to storm events.

In some areas, the effect of waves and tides may actually lead to accretion of the coast which may impact (positively or negatively) upon the activities that can occur at the coast.

The risks from coastal flooding are also likely to increase in the future as sea levels rise due to global climate change (refer to **Section 2.4.3**). In some areas, low-lying coastal land may be given over to permanent inundation through managed realignment schemes in order to offset the flood risk to other areas or to provide compensatory habitat to offset the effects of coastal squeeze/narrowing by allowing continued defence and development in another area or to reduce the overall cost and increase the sustainability of providing and maintaining defences. In other areas it may be necessary to increase the size of existing defences in order to reduce the risk of flooding; however this may not be possible in all areas and so some currently protected areas may need to adapt to more frequent flooding.

### 1.4 Coastal Change Management Areas (CCMAs)

In the past, development along the coast took place with less knowledge of natural processes and flood and erosion risks than we have today. As a result of this there is a legacy of development in areas that are now vulnerable to ongoing coastal change from erosion and flooding.

As recognised in the Shoreline Management Plans (SMPs) for England and Wales,<sup>2</sup> it will not be technically, economically or environmentally sustainable, nor indeed desirable, to defend all locations against future coastal change.

For example, with limited public funding for coastal defence in the future, there will be an increasing reliance on partnership funding<sup>3</sup> to continue to defend currently defended coasts and/or implement coastal resilience measures including coastal change adaptation. It is unlikely that funding of coastal defences under these arrangements will be viable in all areas and therefore it is expected that it will not be affordable to continue defending all areas that currently benefit from protection.

In other areas, it may be necessary to undertake managed realignment in response to coastal change to create new areas of habitat and/or offset flood risk elsewhere, and

<sup>2</sup> Information about SMPs is available on the Environment Agency website at: <http://www.environment-agency.gov.uk/research/planning/104939.aspx>.

<sup>3</sup> Information about partnership funding is available on the Environment Agency website at: <http://www.environment-agency.gov.uk/research/planning/134732.aspx>.

so longer-term planning of development needs to incorporate requirements for such defence realignment plans as set out in SMPs.

In light of this, the UK government has begun to investigate the concept of adaptation as a means of delivering sustainable coastal change solutions. Within the planning system, as set out in the National Planning Policy Framework (NPPF), this is to be delivered through CCMA's.

**Coastal Change Management Area:** An area identified in Local Plans as likely to be affected by coastal change (physical change to the shoreline through erosion, coastal landslip, permanent inundation or coastal accretion).

(Definition taken from NPPF Glossary)

## 1.5 CCMA's and planning policy

The NPPF sets out the Government's planning policies for England. It must be taken into account in the preparation of local and neighbourhood plans, and is a material consideration in planning decisions. Specific to CCMA's, Paragraph 106 of the NPPF states that Local Planning Authorities (LPAs) should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical change to the coast. CCMA's can be devised through local plans, complemented through planning policy, or developed through other policy documents such as Supplementary Planning Documents (SPDs).

**'They should identify as a CCMA any area likely to be affected by physical changes to the coast, and:**

- **be clear as to what development will be appropriate in such areas and in what circumstances; and**
- **make provision for development and infrastructure that needs to be relocated away from CCMA's.'**

**‘When assessing applications, authorities should consider development in a CCMA appropriate where it is demonstrated that:**

- **It will be safe over its planned lifetime and will not have unacceptable impacts on coastal change;**
- **The character of the coast including designations is not compromised;**
- **The development provides wider sustainability benefits; and**
- **The development does not hinder the creation and maintenance of a continuous signed and managed route around the coast [as required by the Marine and Coastal Access Act 2009].’**

(Paragraph 107, NPPF)

**‘LPAs should also ensure appropriate development in a CCMA is not impacted by coastal change by limiting the planned lifetime of the proposed development through temporary permission where development must occur in the CCMA; and restoration conditions where necessary to reduce the risk to people and the development.’**

(Paragraph 108, NPPF)

## 2 Identifying CCMA

### 2.1 A staged approach for identifying CCMA

It is recommended that LPAs follow the staged approach presented in **Figure 2** when developing CCMA. This approach has been adapted from the *West Dorset, Weymouth and Portland Coastal Risk Planning Guide* (see case study in **Appendix A**). **Section 4** of this document sets out key questions for each stage in order to guide LPAs in the development of CCMA; questions that are also highlighted throughout Sections 2 and 3.

#### Stage 1: Reviewing SMP Policies

**Stage 1:** involves appraising the risk from the Shoreline Management Plan (SMP) and interpreting its policies in order to establish potential CCMA (see **Section 2.2**).

#### Stage 2: Identifying Risk

**Stage 2:** through consultation with the Environment Agency and other stakeholders, the coastal change risk for each section of coast within potential CCMA can be identified. This will depend on the setting of the coast and factors influencing risk (see **Section 2.3**).

#### Stage 3: Mapping Areas of Risk

**Stage 3:** is to map the CCMA and the zones of risk within them. This may be based on erosion risk information contained in the SMP, local coastal monitoring (as part of the national coastal monitoring programme), National Coastal Erosion Risk Mapping project (where appropriate and available), expert assessment or any other relevant studies or monitoring data. The resulting areas defined as CCMA may cover (i) lengths of coast from tens of metres to many kilometers in length, (ii) areas of coast from tens of square metres to many square kilometers, and (iii) cover individual SMP policy units, or multiple SMP policy units, based upon the nature of the coast (see **Section 2.4**).

#### Stage 4: Delivering Adaptation through Planning

**Stage 4:** once the CCMA and different risk zones within them are mapped, it is then possible in **Stage 4** to identify adaptation requirements for areas of current or future planned development that are at risk from coastal change, and to determine what type of development should or should not occur in each area feeding into planning policy and development management (see **Section 3**).

Figure 2 Flow diagram setting out the staged approach to developing CCMA

**Stages 1, 2 and 3** of this staged approach are focused on identifying and mapping coastal change risks and are discussed in more detail in **Sections 2.2, 2.3 and 2.4** of this guidance respectively. **Stage 4** of this approach discusses developing local specific adaptation approaches in CCMA and delivering them through planning policy and

development management.

## 2.2 Stage 1: Reviewing SMP policies

As stated in Figure 2 above, Stage 1 of the CCMA development process involves appraising the risk from the Shoreline Management Plan (SMP) and interpreting its policies in order to establish possible CCMA's.

SMPs provide a large-scale assessment of the risks associated with coastal processes and present a policy framework to manage these risks to people and the developed, historic and natural environments in a sustainable manner. However, the SMP does not guarantee funding for implementing the policy. In general, there are four main types of policies defined by SMPs:

- **No Active Intervention (NAI);** the policy assumes that existing defences are no longer maintained and will fail over time, and that currently undefended areas will remain as such for the duration of the associated SMP epoch(s).
- **Hold the Line (HTL);** the policy maintains the level of protection provided by defences in their present location.
- **Managed Realignment (MR);** the policy allows the shoreline position to move backwards (or forwards), with intervention to control the extent and/or rate of movement.
- **Advance the Line (ATL);** the policy builds new defences on the seaward side of the existing defence to reclaim land.

**Potential CCMA's should be defined where:**

- **SMP policy is not to defend the coast (NAI);**
- **SMP policy is to implement managed realignment of a section of coast; or**
- **Shoreline change will be significant over next 100 years; for example, if this will have an important impact on existing development or planned future land use (economically, socially or environmentally).**

The key questions in guiding potential CCMA's in Stage 1 of the process are:

1. Is the SMP policy not to defend the coast (NAI)? If yes, a CCMA may be a useful approach.
2. Is the SMP policy to implement managed realignment of a section of coast? If yes, a CCMA may be a useful approach.
3. Will shoreline change be significant over the next 100 years? For example, will it have an important impact on development or land use economically, socially or environmentally? If yes, a CCMA may be a useful approach.

7

If the answer is yes to any of the three questions, proceed to Stage 2 (**Section 2.3**).

If the answer to these three questions is no, then reference should be made to the FCERM Appraisal Guidance, to develop coastal risk management measures, alongside undertaking ongoing monitoring and review of policy.

## 2.3 Stage 2: Identifying Risk

As stated in Figure 2 above, **Stage 2** of the CCMA development process involves identifying the specific risks within the potential CCMA's identified in Stage 1. This stage should be undertaken in consultation with the Environment Agency and other stakeholders and as outlined throughout this guide, the earlier community engagement plus partnership formation and involvement occurs, the better.

The specific risks within a potential CCMA will depend on the coastal setting and factors influencing risk identification. In the context of this guidance, 'risk' is defined as the adverse impact and consequences of a hazard, which may be coastal erosion, coastal landsliding, coastal accretion or coastal flooding resulting in regular or permanent inundation. CCMA's are therefore areas of projected adverse impact and

consequences where particular consideration should be given during the planning process in order to remove, reduce or mitigate these risks.

This section discusses first the wide variety of coastal settings within which CCMA's may need to be developed, and then key factors that should be considered when identifying risks.

### 2.3.1 Setting of the coast

#### 2.3.1.1 Physical setting

The setting of the coast in which a CCMA is to be defined will have a significant impact on risk identification (refer to **Section 2.3.1.2**) and suitable adaptation approaches (refer to **Section 3**) through the type of coastal change that takes place at each location. **Table 1** below lists examples of different types of coastal settings within which CCMA's may need to be defined, although there are likely to be local variations depending upon specific characteristics of individual areas and these will need to be considered at the local level during this Stage.

The key questions in guiding potential CCMA's in undertaking this part of the process are:

1. What physical setting does the proposed CCMA fall into?
2. Does the proposed CCMA cover more than one physical setting? If yes, it may need to be flexible in drawing on adaptation approaches and planning responses. If no, the approach is likely to be a singular response.

<sup>4</sup> FCERM Appraisal Guidance, Environment Agency, March 2010. Available online: <http://www.environment-agency.gov.uk/research/planning/116705.aspx>.

<sup>5</sup> The relevant SMP will contain details on specific coastal setting types along a section of coast.

*Table 1 Examples of different types of coastal setting in which CCMA's may need to be developed*

Area Setting	Details
Natural (Undefended) Coastlines	<p>Cliffs (<i>see also Section 2.3.2.5</i>)</p> <ul style="list-style-type: none"> <li>• Soft cliffs experiencing simple erosion / landsliding with regular / high rates of retreat</li> <li>• Soft cliffs experiencing complex landsliding / instability with infrequent, unpredictable, large impact events.</li> <li>• Hard cliffs with simple erosion / rock falls and low rates of retreat.</li> <li>• Natural, undefended cliffs along open coasts that may or may not be fronted by beaches.</li> </ul>
	<p>Beaches and Sand Dunes<sup>5</sup></p> <ul style="list-style-type: none"> <li>• Sand dunes fronting low-lying land at risk of flooding and/or where landward migration of the dunes may occur if not impeded by backing higher ground.</li> <li>• Barrier beaches fronting low-lying land at risk of flooding.</li> <li>• Shingle beaches with accretion issues, causing problems with coastal recreation and fishery business beach launch vessels.</li> </ul>
	<p>Estuaries</p> <ul style="list-style-type: none"> <li>• Extensive areas of inter-tidal mudflats or salt marsh that provide a degree of natural protection to low-lying land at risk of flooding (wide areas of mudflat or salt marsh cannot guard against high still water levels).</li> </ul>
Defended	It should be noted that coastal defences do not remove all risk of flooding and

Coastlines erosion as they can be overtopped, overwashed or breached during extreme events. Existing defences may also deteriorate if not adequately maintained due to lack of funding and/or changes in SMP policy. Risks will also increase in future due to sea level rise if defences are not upgraded in response. These factors must be considered before ruling out the need for CCMA in defended areas. The following are some examples of different types of defended coastal

<sup>6</sup> Further information about beaches and sand dunes is provided in the CIRIA Beach Management Manual: <http://www.ciria.org/service/knowledgebase/AM/ContentManagerNet/ContentDisplay.aspx?Section=knowledgebase&ContentID=17714>.

<sup>7</sup> The Salt Marsh Management Manual provides a source of further information: <http://evidence.environment-agency.gov.uk/fcerm/en/Default/HomeAndLeisure/Floods/WhatWereDoing/IntoTheFuture/ScienceProgramme/ResearchAndDevelopment/FCRM/Project.aspx?ProjectID=bb311744-35f9-4407-b282-a29d08024801&PageID=56bad68e-dcb1-4bf8-84cc-cbf03ab63a2>.

Area Setting	Details
	<p>settings:</p> <ul style="list-style-type: none"> <li>• Hard defences (seawalls / revetments) protecting low-lying land at risk of flooding along the open coast, (may or may not be fronted by beaches).</li> <li>• Hard defences (seawalls / revetments) protecting cliffed areas along the open coast at risk of erosion (sometimes supported by slope stabilisation measures), and may or may not be fronted by beaches.</li> <li>• Hard defences (embankments) protecting low-lying land at risk of flooding along estuary coasts. In some locations (especially within estuaries), defences may be fronted by areas of salt marsh and / or intertidal mudflats of varying width.</li> <li>• Areas defended by transport (e.g. railways / highways) or marine (e.g. port) infrastructure that directly or indirectly provide a coastal flood and / or erosion defence function (e.g. port breakwaters).</li> <li>• Soft defences. For example, managed realignment protecting urban and some rural areas from coastal flooding through building coastal or estuarine defences further inland to create new wider areas of intertidal foreshore. The process also offers excellent opportunities to create successful coastal habitats.</li> </ul>

### 2.3.1.2 Features, assets and land uses

As stated above, CCMA should be defined where:

- SMP policy is not to defend the coast (NAI);
- SMP policy is to implement managed realignment of a section of coast; or
- Shoreline change will be significant over next 100 years; for example, if this will have an important impact on existing development or planned future land use economically, socially or environmentally.

In order to plan for and manage coastal change in such areas, the identification of CCMA and risk zones within them must therefore take due account of both:

1. the existing features, assets and land uses at risk within a potential CCMA in order to develop and implement policies and plans – in conjunction with owners and local stakeholders – for the adaptation of these existing features, assets and land uses in response to future coastal change; and
2. planned future development within a potential CCMA such as housing and employment allocations in a Local Plan or proposed future infrastructure within an infrastructure delivery plans.

As such, the following gives examples of existing and future features, assets and land

uses that may be at risk within potential CCMAAs and so influence the formation of CCMAAs:

- The distribution of existing and future planned houses in relation to erosion risk – e.g. it may be beneficial to include or exclude whole communities

10

affected by coastal change in CCMAAs rather than “drawing a line through the village”, although such an approach would need to be underpinned by the understanding of the risk level.

- Areas required for relocation or roll-back of properties and infrastructure, which may result in the need for extending CCMAAs, particularly where they are adjacent to the coast and may require time-limited planning permission.
- Existing and planned future infrastructure particularly where the infrastructure is at different risk to the community that it serves (e.g. coastal roads that serve several villages or utilities and services).
- Existing and planned future areas of agricultural land use.
- Existing isolated properties along the coast.
- Natural environment features (e.g. Special Protection Areas and Sites of Special Scientific Interest); *NB: due to the legal requirements associated with many of these designations, further detail is provided below.*
- Cultural heritage assets (e.g. scheduled monuments and listed buildings); *NB: due to the legal requirements associated with many of these designations, further detail is provided below.*
- Other existing and future features, assets and land uses specific to local issues.

Specifically, the coastline of England is recognised for its varied habitats, landscapes, seascapes and flora and fauna. This diversity is reflected in the numerous different environmental designations of different parts of the coast, upon which the positive and negative impacts of coastal change adaptation must be considered when defining CCMAAs as many of these designations are protected in law. **Figure 3** shows the various types of natural environment designations through different levels of governance.

*Figure 3 Different Levels of Environmental Designations*

11

Again, there are also many cultural heritage assets around the coast, some of which are protected in law. The following lists the general types of historic and cultural environment features that may influence the definition of CCMA:

- Areas of known historic environment, assets and archaeological features.
- Areas of suspected historic environment and archaeological features.
- Historically-important coastal operations and activities (e.g. fishing, ports, mining, industry) which create social cohesiveness and reinforce sense of place.

**BOX 1** (also **Appendix A**) below provides an example of risk identification by West Dorset District and Weymouth & Portland Borough Councils. The Councils identified specific threats from undefended cliffs and changing SMP policies to settlements and key transport routes running through the locality. In effect this has helped to devise a planning guide for the area and a staged approach to risk and CCMA identification (as exemplified by **Figure 2** of this guide).

#### **BOX 1, Case Study Summary: West Dorset, Weymouth & Portland Coastal Risk Planning Guide**

There are many coastal change issues facing the coastline of West Dorset, Weymouth and Portland:

Undefended cliff areas have the potential for large amounts of cliff top recession, which in some cases could impact upon significant areas of existing development. Some areas of smaller settlements also face the possibility of changes in SMP policy from current policies of 'Hold the Line' to either 'Managed Realignment' or 'No Active Intervention' in the medium- to longer-terms.

A number of key transport routes are also threatened by future coastal change in the longer-term. There are limited options for alternative routes and so short-term planning decisions need to be mindful of the future transportation infrastructure requirements that may be 50 or more years in the future.

In addition many of the larger settlements will need to face up to the dual challenges of sea level rise in terms of increased risk of coastal flooding and reduction in the size of beach due to coastal squeeze.

In response, the respective Councils developed internal guidance for both planners and engineers on the nature of risk posed to coastal areas from coastal change.

**A key lesson learnt** was that the staged approach was found to provide a robust and auditable approach to developing the planning guidance. In doing this they identified separate sections of the coast and potential assets at risk.

By way of summary, the key questions in guiding potential CCMA in undertaking this part of the process are:

1. What features, assets and land uses are within the proposed CCMA boundary?
2. Are there any features, assets or land uses from neighbouring authorities that should be considered or will impact or be impacted upon by coastal change in the potential CCMA?
3. Are there any planned and future developments that may be affected by the CCMA? For example, are there any recently-approved planning applications, employment or housing allocations within adopted Local Plans, or forthcoming infrastructure identified in the infrastructure delivery plan?

4. Are there any planned and future developments from neighbouring authorities that should be considered or will impact or be impacted upon by coastal change in the potential CCMA?

### 2.3.2 Factors influencing coastal change risk

The key question in guiding potential CCMA in undertaking this part of the process is:

1. What factors influencing coastal change risk are relevant to the context, assets, features and land uses of the proposed CCMA?

The following sections consider various factors that influence the coastal change risk for each section of coast within potential CCMA.

#### 2.3.2.1 Flood risk

There are many areas along the coast of England that are vulnerable to coastal flooding. The Environment Agency flood zone maps provide a rapid means of assessing flood risk, whilst Strategic Flood Risk Assessments (SFRAs) and Preliminary Flood Risk Assessments (PFRAs) provide further detail on flood risk in an area from all potential sources of flooding, including the effects of climate change and sea level rise, meaning that they are useful tools in flood identification.

#### 2.3.2.2 Funding of coastal defences and adaptation

The adoption of an SMP policy does not guarantee funding for coastal defence schemes, or indeed delivery of the policy. Instead, it identifies where future flood and coastal erosion spending should, if the necessary business case for national and local funding can be made, potentially be targeted. As stated in Section 1.4, future funding of coastal defences will be increasingly reliant upon partnership funding arrangements to continue to defend currently defended coasts, and it is unlikely that funding of coastal defences under these arrangements will be viable in all areas so it will not be affordable to continue defending all areas that currently benefit from protection. Therefore, when identifying risk, it will be important to have an understanding of how likely it is that funding will be obtained for future coastal defence schemes and be aware that, whilst a scheme may be proposed, it may not necessarily be implemented due to funding constraints.

#### 2.3.2.3 Localised land and property management

In some areas modification of land and/or property by individual owners can have adverse effects on land stability in particular, contributing to the factors that lead to coastal change. Examples of adverse land and property management practices include:

- Blocked or altering drainage ditches.
- Allowing water to collect or pond on the land.
- Shifting water or soil problems down-slope to neighbouring land/property.
- Excavating into cliffs or slopes without seeking professional advice.
- Felling trees or landscaping cliffs and slopes may increase soil erosion and instability.
- Installing private (unauthorised) defences.
- Removing sand or gravel from beaches or dunes.
- Failing to control leaking and overflowing swimming pools, ponds gutters, downpipes, septic tanks and water butts.
- Using tarmac etc for driveways and hard surfaces, which promotes surface water run-off.

The identification of inappropriate land management and / or property management approaches will inform the definition of risk zones for CCMA, particularly in areas

of coastal instability. Once identified in a CCMA risk zone, the development of planning policies to be defined in a CCMA will require consideration of how to manage the issues listed above.

#### 2.3.2.4 Managed realignment

SMP policies and works to implement managed realignment involve intervention to control or limit change in the position of the coastline. This can be applied in areas at risk of either flooding or erosion.

CCMAs need to be defined in areas where managed realignment is likely to occur. In some cases, feasibility studies may already have occurred or be underway. In these cases, the definition of CCMAs in areas of managed realignment can be based upon detailed work. In areas where SMP policy of managed realignment is applied to areas at risk of coastal erosion and land sliding, CCMAs should take a precautionary approach and be defined using worst case assumption of 'No Active Intervention'.

#### 2.3.2.5 Coastal erosion and accretion

As discussed in **Section 1.3**, coastal change can take place in a variety of forms, and each needs consideration when identifying coastal change risks in potential CCMAs. Allowing the continuation of erosion in some areas is also necessary for the benefit of other sections of coast.

In terms of coastal erosion and landsliding that results in the landward retreat of cliffs, it is important to understand the different cliff types and associated processes that drive erosion and landsliding in order to determine the exact nature of coastal

change risks and so determine suitable CCMA approaches. These cliff types (illustrated in **Figure 4**) can be categorised as:

- **Simple cliff:** falls or slides leading directly to foreshore deposition. Erosion is at the base and therefore sea level is a determining factor in erosion.
- **Simple landslide:** falls or slides with variable amounts of storage along the shoreline often forming a beach. Erosion at the base but also from excess groundwater. Both sea level and rainfall are determining factors in erosion.
- **Composite cliff:** formed where hard rocks are underlain by soft rocks which can lead to high magnitude and low frequency erosion. Prone to erosion at the base as well as from excess groundwater.
- **Complex cliff:** is a combination of both falls and landslides. The output from one can input into the next.

*Figure 4*                      *Types of coastal cliff system (from Environment Agency, 2010s)*

In addition to coastal erosion resulting in cliff retreat, future sea levels rise (refer to **Sections 1.2** and **2.4.3**) will also result in a range of other impacts that will drive coastal change, including, but not limited to, the following:

- Increased coastal squeeze or narrowing will impact the natural influence of beaches, salt marshes and mudflats on reducing wave energy before it reaches

<sup>8</sup> *Assessment of Coastal Erosion and Landsliding for the Funding of Coastal Risk Management Projects: Guidance Notes*, Environment Agency, December 2010.

coastal defences, thus exposing these defences to greater pressures. This impact will be exacerbated further by deeper water levels allowing larger waves to reach closer to the shoreline and so deliver increased energy at the coast. Where the defences are man-made then they may need to be increased in size and/or altered in their configuration to remain effective. Where the defences are natural, such as sand dunes, then there will be greater erosion of these features.

Coastal squeeze or narrowing could also impact upon current activities in an area. If, for example, there is an associated lowering of beach levels adjacent to access steps, ramps or slipways used for coastal economic activities, access to the coast may be hindered and measures to address this situation will need to be considered whilst defining CCMA's.

A further risk posed by coastal squeeze or narrowing is the potential for this to reduce the amount of available beach resource that is often vital to the tourism economy of many coastal areas. This impact could occur even where the SMP policy is to continue to defend as future defence may only involve larger hard-defences rather than provision of artificial beaches. It is therefore an important factor to consider when defining CCMA's as loss of beach resource for tourism is likely to have implications for the future local development needs (i.e. will need to consider alternative or non-tourism focussed industries for future local economy).

- Increased coastal accretion may occur in some locations as a result of the increased erosion providing greater amounts of sediment to the coastal system and changes to the sediment transport processes. This in turn may result in greater areas of beach, sand dunes, salt marsh or inter-tidal areas in some locations that may provide more natural protection and so offer potential for positive impacts of coastal change that may be exploited in a sustainable way to the benefit of an area. That said, coastal accretion could also impact upon current activities in an area if, for example, accretion results in siltation and infilling of harbours that are used for coastal economic activities such as fisheries, dive charters and marinas etc.

By way of summary, the key question in guiding potential CCMA's in respect of considering coastal erosion and accretion is:

1. What are the types and current levels of coastal erosion and / or accretion to the potential CCMA?

#### 2.4 Stage 3: Mapping areas of risk

As noted in **Section 2.1**, the areas defined as CCMA's may cover (i) lengths of coast of from tens of metres to many kilometers in length and (ii) cover individual SMP policy units, or multiple SMP policy units. This will be guided by the nature of the coast but it is recommended that the SMP policy units be adopted as a starting point. These can then be refined through the development of CCMA's in consultation with stakeholders.

Risk zones should also be defined for appropriate periods such that they identify risks in the near future for the time-frame covered by local plans (i.e. 20-25 years) whilst also identifying longer-term risks in line with the SMP planning time-frame

(i.e. 100 years). The time-frames used for defining risk zones should also reflect the type and extent of risk in a particular location, which, for example, will be different on rapidly-eroding coastlines compared to coastlines that erode more slowly.

The key questions in guiding potential CCMA's in undertaking this part of the process are:

1. Which risk zone mapping approach is most suitable to local circumstances and context of coast in proposed CCMA?
2. Do CCMA boundaries need amending from the risk zones in order to avoid cutting through settlements or transport infrastructure etc. or to allow for roll-back, relocation or diversion of infrastructure?

It is therefore recommended that risk zones be produced in a variety of ways, such as:

- Production of relatively simple risk zone mapping in a similar way as they are produced in SMP2 covering three time-periods (0-20 years, 20-50 years and 50-100 years), within which different planning policies may be defined. **Figure 5** provides an example of such risk zone mapping.

*Figure 5 Example of erosion risk zones covering different time-periods within a CCMA based on similar approach taken to mapping in SMP2s.*

- Production of risk zones based upon projections using a combination of SMP2 data and more specific local coastal erosion monitoring data, to which different risk levels can then be assigned to individual properties or other assets in the risk zone. This approach is demonstrated by East Riding of Yorkshire Council (refer to **BOX 2** and **Figure 6**).

18

Lower  
risk area

Higher  
risk area

Imminent  
risk area

*Figure 6 Example of mapping areas of 'imminent', 'higher' and 'lower' risk of cliff erosion (based on mapping from East Riding of Yorkshire Council) for illustration only; see also BOX 2.*

**BOX 2, Case Study Summary: East Riding of Yorkshire Council's approach to mapping erosion risk**

Through the East Riding of Yorkshire Coastal Change Pathfinder project (completed in 2012), East Riding of Yorkshire Council refined its approach to establishing the level of erosion risk to property. Used consistently in residential locations since 2009, the approach is based upon projections within the Flamborough Head to Gibraltar Point Shoreline Management Plan (SMP) and the Council's coastal erosion monitoring programme; officers use both erosion records and cliff line projections to assign one of the three risk levels – imminent, high or low – to individual properties in the coastal zone.

The Council's definition of imminent risk is based upon its records of maximum cliff losses in all coastal locations. Therefore, a property/structure is at imminent risk (level 1) when it is within the maximum recorded loss distance of the cliff edge for its particular location. A dwelling at higher risk (level 2) is beyond the maximum annual loss distance for its particular location but within the area projected to be lost by 2025 based on cliff line projections within the SMP. Finally, a dwelling at lower risk (level 3) is located between the projected 2025 and 2055 cliff lines within the SMP. The consistent approach enables the Council to prioritise applications for advice and support based upon applicants' levels of risk, rather than their geographical locations. This approach will be embedded in the Council's Coastal Management Framework during 2013/14. See **Appendix A** for the full case study.

19

- Production of risk zones based upon detailed ground investigation and understanding of land stability, particularly in areas prone to coastal landslip. **Figure 7** provides an example of this approach.

*Figure 7 Example of coastal risk zone mapping based upon detailed understanding of land instability (courtesy: West Dorset District Council).*

- Production of risk zones in areas where the SMP policy is for managed

realignment may be based upon findings from detailed study of managed realignment options. However, it is often the case that such studies are yet to be undertaken, particularly where the realignment policy is not to occur until the medium- to long-term. In these areas risk zones can be defined based upon expert assessment of the likely extent within which managed realignment would be expected to occur based upon available data and topography of the area. **Figure 8** provides an example risk zone map for potential managed realignment extent based upon such an approach.

20

*Figure 8 Example of mapping potential coastal change zone in areas where the SMP policy is for managed realignment but for which no detailed study has yet been completed. (courtesy: West Dorset District Council).*

Mapping can be based on erosion risk information contained in the SMP, local coastal monitoring (as part of the National Coastal Monitoring Programme), National Coastal Erosion Risk Mapping (where available and appropriate), or any other relevant studies or monitoring data. In addition, expert assessment of complex cliff and managed realignment areas using best available data may be required (see **Section 2.4.1**). Similarly, **Section 2.4.2** on flood risk discusses data available on flood risk from the Environment Agency and how it impacts on risk identification. The same data can also be used as part of the mapping exercise in **Stage 3**.

For specific case study examples see East Riding of Yorkshire and Cowes to Gurnard, Isle of Wight (**Appendix A**). Both examples discuss the role of planning policy alongside the use of stability studies and erosion rates in providing a methodological approach to mapping and identifying areas and development most at risk from cliff erosion and instability in order to support both planning policy and development

Whilst the mapping of risk zones is based upon calculation of theoretical extents of coastal change, it is important to note that the identification of the overall CCMA extent may need to differ slightly from the calculated risk extents in some locations. CCMA areas can encompass several different risk zones and include both the area predicted to be subject to direct coastal change and areas that are also affected by consequential adaptation. For example, where the theoretical 100-year risk zone boundary calculated from erosion rate data would bisect large properties, infrastructure assets or communities, it may be appropriate to adjust the boundary of the risk zone to a more logical physical boundary (e.g. road) for defining a planning constraint zone such as a CCMA, even if this were more conservative than the more theoretical approach.

#### 2.4.1 Erosion risk mapping

Erosion rates are often available in SMPs and the National Coastal Erosion Risk Map (NCERM) for England and Wales, whilst in some areas local coastal monitoring data (collected as part of the National Coastal Monitoring Programme) will also be available. With reference to **Section 2.3.2.5**, the assessment coastal erosion risk for the 'simple cliff', 'simple landslide', and 'composite cliff' types of cliff can be treated the same way and be based upon a long-term average erosion rate, typically provided in each SMP and NCERM. This can then be used to map potential areas at risk.

'Complex cliffs' should be treated separately due to their complex pattern of change. SMPs may or may not have reflected such erosion risks whilst NCERM does not include risk zone mapping of complex cliff areas. As such, defining erosion risk zones in complex cliff areas requires specialist assessment of available data, including more specific local coastal monitoring data and/or ground investigation data, in order to make predictions of the potential future cliff recession and coastal slope instability. It may be appropriate in such areas to supplement erosion risk zone mapping with detailed mapping of land instability, see example in Figure 7, to inform CCMA policies and development management decisions.

#### 2.4.2 Flood risk mapping

As noted above in **Section 2.3.2.1**, the Environment Agency's flood zone maps provide a rapid means of assessing flood risk, whilst SFRAs and PFRAs provide further detail on flood risk in an area from all potential sources of flooding, including the effects of climate change and sea level rise, and are therefore useful tools in flood identification. Alternatively, numerical modelling of flood risk for a specific location can be undertaken if there is insufficient data available from these sources.

#### 2.4.3 Climate change and sea level rise

Defra and the Environment Agency provide guidance and advice on the consideration of climate change impacts on flood and coastal erosion risks. The most

© *Cliff Instability and Erosion Management in Great Britain: A Good Practice Guide*, Halcrow, July 2011.

recent *Advice for Flood and Coastal Erosion Risk Management Authorities*<sup>10</sup> suggests that predictions of the future rates of sea level rise for the UK coastline should be taken from UKCP09<sup>11</sup> which provides sea level rise projections for a 100 year period from 1990. Anticipated rates of relative sea level rise and surge estimates over different time periods and different scenarios can then be derived for specific locations. Importantly, the advice recognises uncertainty and recommends an approach considering a range of future scenarios.

#### 2.4.4 Consultation

The selection of the best approach should involve consultation with the relevant stakeholders as stated in the opening paragraph to **Section 2.4**. However, consultation should not end here, and it is important to maintain this consultation throughout the CCMA development. As such, upon completion of the mapping exercise, consultation should be undertaken on the boundaries for the CCMA with relevant bodies and the local community. Upon completion of consultation it may be necessary to make changes to the boundaries based on further local knowledge and circumstances.

<sup>10</sup> *Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities*, Environment Agency (2011). Web page: <http://www.environment-agency.gov.uk/research/planning/116707.aspx>.

<sup>11</sup> <http://ukclimateprojections.defra.gov.uk/>

## 3 Delivering Adaptation through Planning

The following section discusses **Stage 4** of the staged approach to the development of CCMA as set out in **Section 2.1**.

### Stage 1: Reviewing SMP Policies

**Stage 1** involves appraising the risk from the Shoreline Management Plan (SMP) and interpreting its policies in order to establish potential CCMA (see **Section 2.2**).

### Stage 2: Identifying Risk

**Stage 2**: through consultation with the Environment Agency and other stakeholders,

the coastal change risk for each section of coast within potential CCMA can be identified. This will depend on the setting of the coast and factors influencing risk (see **Section 2.3**).

### Stage 3: Mapping Areas of Risk

**Stage 3:** is to map the CCMA and the zones of risk within them. This may be based on erosion risk information contained in the SMP, local coastal monitoring (as part of the national coastal monitoring programme), National Coastal Erosion Risk mapping (where appropriate and available), expert assessment or any other relevant studies or monitoring data. The resulting areas defined as CCMA may cover (i) lengths of coast from tens of metres to many kilometers in length, (ii) areas of coast from tens of square metres to many square kilometers, and (iii) cover individual SMP policy units, or multiple SMP policy units; this will be guided by the nature of the coast (see **Section 2.4**).

### Stage 4: Delivering Adaptation through Planning

**Stage 4:** once the CCMA and different risk zones within them are mapped, it is then possible in **Stage 4** to identify adaptation requirements for areas of current or future planned development that are at risk from coastal change, and to determine what type of development should or should not occur in each area feeding into planning policy and development management (see **Section 3**).

This section begins with discussing various adaptation approaches and developing them to be locally-specific. The final part of this section discusses delivering these responses through planning policy and development management.

#### 3.1 Adaptation approaches

Each adaptation approach needs to be tailored to a specific locality depending on the risk identified and mapped in **Stages 2 and 3** (refer to **Sections 2.3 and 2.4**). It is not a 'one size fits all' approach and therefore a tailored approach to adaptation needs to be developed. Through the case studies included in **Appendix A**, various adaptation

approaches to coastal change are considered. **Table 2** incorporates some of these into a matrix which considers the approaches suitable to various physical coastal settings (as discussed in **Section 2.3.1.1**).

The table should be used as a starting point to determining potential adaptation approaches for potential CCMA. To use the table consider the potential CCMA and the coastal physical setting it encompasses. This may be a singular setting or combine numerous settings. For each adaptation approach, a tick has been used to mark against which coastal settings the approach may be most suitable. As such, **Table 2** may be used by selecting a relevant coastal setting for the potential CCMA under consideration and then assessing if the identified potential adaptation approaches may be appropriate in it. However, it should be noted that local circumstances may also dictate particular approaches in potential CCMA. Similarly, if more than one setting is considered present in the potential CCMA, then elements of one approach along with others, or even an approach not listed, may be the best way for adaptation in that CCMA. Despite these limitations, it is considered the table below offers a useful starting point as a check list.

Table 2 Matrix of adaptation approaches suitable to different physical coastal settings

Adaptation Approaches	Coastal physical settings considered for adaptation				Defended Coastlines
	Cliffs	Beaches	Sand Dunes	Estuaries	
Rollback or relocate property, community facilities and infrastructure.	✓	✓	✓	✓	
Avoid development in vulnerable areas.	✓	✓	✓	✓	

Identify suitable type of time-limited (temporary) development that could occur.	✓	✓			
Ensure new development does not cause adverse effects / transfer coastal change risks to other areas.		✓	✓	✓	✓
Use area action plans / neighbourhood plans to manage future development in coastal communities.		✓	✓	✓	✓
Encourage new developments to incorporate green space to help manage future risks.				✓	✓
Introduce resilience measures to property / infrastructure where relocation is not possible. To support this, provide advice to developers / property owners / businesses on the measures they can take.		✓		✓	✓

Adaptation Approaches	Coastal physical settings considered for adaptation				
	Cliffs	Beaches	Sand Dunes	Estuaries	Defended Coastlines
Implement managed realignment to manage coastal change, working with natural processes and restoring habitat.		✓	✓	✓	
Develop community / individuals' emergency response plans in case of future coastal change incidents.	✓	✓		✓	✓
Develop community / individuals' recovery plans to respond to a coastal change incident occurring.	✓	✓		✓	✓
Improve the response to events by the emergency response organisations.	✓	✓		✓	✓
Introduce flood defences that are flexible to risk changes over time, and resilient to extreme weather events and the longer-term projected impacts.		✓		✓	✓
Remove defences to restore natural processes, making use of the natural environment.		✓	✓	✓	✓
In relation to historical assets, explore other ways to conserve the asset in situ but also record assets to secure the evidence.	✓	✓	✓	✓	✓

Using Table 2, a key question in guiding potential CCMA in undertaking this part of the process is:

1. What may be a suitable adaptation approach based on the answers to the two key questions asked in Section 2.3.1.1?

### 3.1.1 Developing locally-specific adaptation approaches

As discussed in the explanatory paragraph to **Table 2**, circumstances may dictate locally-specific adaptation approaches. Similarly, the existence of numerous coastal physical settings in a potential CCMA may require elements of one adaptation

approach listed in the table above incorporated with other elements from different approaches. In order to be flexible when considering adaptation approaches it is therefore also important to consider local circumstances. This section goes on to consider implications from funding, community engagement and both administration and strategic levels.

### 3.1.1.1 Funding for coastal defences and adaptation

The availability of funding is an important factor in selecting a suitable adaptation approach. As stated in **Section 1.3**, future funding of coastal risk management measures including coastal defences, coastal resilience and coastal change adaptation will be reliant on partnership funding arrangements. This change in approach, introduced in 2011<sup>12</sup>, opens up the potential for partnership funding, between numerous public and private bodies and reflecting the fact that flood and coastal erosion risk management schemes provide multiple benefits to communities and not solely protection. What remains to be seen, however, is how many areas will be able to achieve the required levels of funding contribution to deliver future coastal risk management schemes. In addition, it is also important to note that central government partnership funding contributions via Flood Defence Grant in Aid will only be available to areas where the SMP policy is to Hold the Line or undertake Managed Realignment. As such the development of CCMA needs to consider a variety of ways of delivering the funding required for implementing the policies and plans for coastal change adaptation in an area from sources outside of the Flood Defence Grant in Aid funding route.

#### **BOX 3: Funding Adaptation Ideas**

Utilise a range of funding streams in addition to the central government budget for FCERM measures (e.g. Community Infrastructure Levy) to fund coastal adaptation measures (e.g. including regeneration in adaptation measures may be one way of attracting multiple funding streams).

Seek partnerships with developers/businesses/communities to raise funds to adaptation measures.

Ensure inter-generational equity, for example avoiding complex, expensive flood defences that future generations may struggle to maintain and replace;

Use funding to enhance local economies, for example by increasing local tourism through improved public access and habitat creation;

Create a financial safety net for the poorest in society, who are likely to be the most vulnerable to the impacts and least able to afford protection (including insurance).

When considering funding impacts on developing local specific adaptation approaches, it is important to consider the benefits of the potential adaptation approach to be applied. Similarly, it may also be a useful exercise to consider how the benefits could be maximised. By identifying the benefits of an approach, it may be feasible to identify potential funders for the adaptation. The partnership behind each project is vital to securing third-party funding, providing a range of vehicles with which to apply for funding, and a range of contacts with information about relationships with funders. It is assumed that some funding will be associated with the direct outputs, e.g. X number of homes removed from flood risk, but that other

<sup>12</sup>Flood and Coastal Erosion Resilience Partnership Funding: Defra policy statement on an outcome-focused, partnership approach to funding flood and coastal erosion risk management. Defra. 23<sup>rd</sup> May 2011.

funders will seek a broader range of outcomes that involve community engagement and involvement with the project at a range of levels. It is therefore essential that the community is involved with the partnership and all proposed solutions from the start (as discussed in the subsequent section and in **BOX 4** below).

**Box 4** provides a case study demonstrating how early engagement across a variety of stakeholders can be a useful tool in establishing partnerships to fund and guide adaptation approaches.

#### **BOX 4, Case Study Summary: Reculver Masterplan**

In order to address the various coastal change issues in the area, a Masterplan was developed with the aim to provide a co-ordinated vision for the enhancement of Reculver. As there are various stakeholders (public and private) and numerous potential funding streams, the Masterplan is not overly prescriptive.

Two key projects were outlined to be completed at the start of the Masterplan. The first was the establishment of a Public-Private Partnership Group to deliver a co-ordinated stakeholder approach to the development of Reculver. The second was the appointment of a 'Reculver Co-ordinator' with the objective of driving the delivery of the Masterplan projects and co-ordinating the interests of stakeholders. See **Appendix A** for full case study.

**Key lesson learnt** was how long-term planning for an area's development can incorporate coastal change, particularly through community engagement.

The following matrix (**Figure 9**) has been devised in order to aid and guide consideration of funding implications when developing locally-specific adaptation approaches. It is intended as an initial guide to help direct fundraising efforts. However, if project- or area-specific knowledge suggests a funding source may have greater or lesser potential than is suggested by this matrix, any such evidence should take precedence. A range of potential benefits from adaptation approaches has been considered against potential funding sources. It has then been colour-coded in order to identify the likelihood of funding for each potential benefit of the adaptation approach. As such, green is considered for strong potential of funding, orange for modest potential and red for low potential. The matrix is purely indicative, however, and would become a more useful tool once adapted to local circumstances.

Key questions in guiding potential CCMA's in undertaking this part of the process are:

1. Have the benefits of the proposed approaches been identified as per the matrix in Figure 9? Could you make this matrix specific to your local authority area?
2. What funding is available in the proposed CCMA in relation to the proposed adaptation approaches identified using Table 2 (refer to **Section 3.1**)?
3. What is the likelihood of attaining funding towards adaptation?
4. How can opportunities be maximised?

### 3.1.1.2 Community engagement

The development of CCMA and implementation of adaptation approaches will need to consider the types of communities that are affected by coastal change as this will influence: (1) the selection of adaptation approaches; and (2) how those communities are engaged during the development of CCMA. It is worth noting, like in the case of East Riding of Yorkshire, CCMA can be developed through Local Plan production (refer to **BOX 9** and **Appendix A**). As such, CCMA may be subject to the same consultation as that of Local Plans and therefore put through both a lengthy public consultation of numerous phases and examination by a planning inspector. The following categories in **Table 3** are useful in considering different adaptation approaches in different settings.

Table 3 Types of communities

Area Setting	Details
Rural Communities	<ul style="list-style-type: none"> <li>• High and low income areas.</li> <li>• High number of second homes.</li> <li>• Isolated communities – low education, access to amenities and low employment</li> <li>• Fishing communities</li> <li>• Communities with high proportion of retired/vulnerable residents.</li> <li>• Communities with high visiting populations during summer, but low winter populations.</li> </ul>
Urban Communities	<ul style="list-style-type: none"> <li>• High and low income areas.</li> <li>• Residential areas.</li> <li>• Employment areas.</li> <li>• Low number of second homes.</li> </ul>
High Deprivation	<ul style="list-style-type: none"> <li>• Low value housing.</li> <li>• High social deprivation index.</li> <li>• Communities with low-skill levels (e.g. related to seasonal tourism economies), making them unattractive to inward business development that requires high skill levels in the jobs market.</li> </ul>
Low Deprivation	<ul style="list-style-type: none"> <li>• High value housing.</li> <li>• Low social deprivation index.</li> </ul>

- Developing Communities
  - Communities that accept change is/will occur and willing to engage.
  - Communities that do not accept change is/will occur and are not willing to engage.

Engaging with the community through a variety of means is important to ensure that all views are taken on board and a co-ordinated approach is developed. However it is also important to ensure that appropriate language is used in both consultation and policy development. Good community and stakeholder engagement can increase awareness and appreciation of coastal change, but also shape future adaptation

approaches. A good example of this is the Steart Coastal Management Scheme (**Appendix A**), South Milton Sands (**Appendix A**) and Towards an Integrated Coastal Zone Management on the Manhood Peninsula (see **Appendix A and Box 7**). However, the following case study (**BOX 5**) takes a more community-based approach to developing an adaptation approach. Potential community engagement ideas are considered on the following page.

**BOX 5, Case Study Summary: Alde and Ore Future Pilot Project, Suffolk**

The case study was a community-based approach to tackling issues affecting life around the Alde and Ore Estuary. The project was set up with the idea to get those affected by decisions about the future to become part of how decisions are to be made. This contributed to a much broader and inclusive view, often coming up with innovative solutions to problems that initially seemed intractable.

Working groups chaired by, and made up of, local people explored a range of issues facing the community. Conclusions were then shared through a number of 'drop-ins' to gain feedback from the wider community. A subsequent consultation event, 'The Big Conversation', was split across three themes and launched to develop these issues on a much wider basis – a culmination on feedback from two community conferences, local meetings and workshops. From this activity, further key themes were identified.

The responses have directly fed into the production of The Framework Plan for the Estuary, along with the establishment of the Alde and Ore Estuary Partnership which has helped move decisions on flood defences to a more local-based level. See **Appendix A** for the full case study.

**Key lessons learnt** were engaging early but also appreciating that solutions can be found locally.

**BOX 6: Community Engagement Adaptation Ideas**

Engage with communities/businesses to develop coastal change initiatives/plans that can deliver multiple benefits.

Undertake education programmes to raise awareness/acceptance of coastal change and the need to plan and manage it at both the community and individual level. Use a range of methods to engage with different audiences, such as:

- Visualisations of how the coast may look in the future.
- Historic evidence of actual changes that have occurred over centuries/decades in localities.
- Provide access to areas where coastal change is occurring to give first-hand experience.

Develop register of those local businesses that are willing/able to help in the event of a coastal change incident.

Involve local people and community groups in risk assessment to raise awareness of risk from all local sources of flooding and coastal erosion and empowering them to manage those risks;

Give local communities a greater stake in project design and delivery at an early stage, and seek feedback at all stages;

Be open about the costs and the benefits, including non-financial costs and benefits, (and the distribution of those cost and benefits across social groups, generations and geographical areas) of different ways of managing risk.

Set relevant local objectives, which local people clearly understand, and publish clear reports on progress towards sustainability.

Provide advice/information on coastal change to local estate/letting agents.

Key questions in guiding potential CCMA in undertaking this part of the process are:

1. What communities are within the CCMA? Need to consider social factors including deprivation levels and public awareness of coastal change management issues locally (see Table 3).
2. What are the barriers to engagement of the communities identified in question 1? How can these be overcome?
3. What are the organisational structures of the proposed CCMA and local authority e.g. unitary or metropolitan?
4. What other organisations can or should be involved? Which key stakeholders need to be involved in developing the CCMA?
5. How can this be maintained to ensure an effective CCMA?
6. Based on preceding evidence and ongoing consultation, what potential uses would and would not be acceptable within the CCMA?

**3.1.2 Administration and strategic levels**

Different organisational structures exist within and outside LPAs that will be important in the implementation of approaches. Some LPA structures are well integrated to deal with coastal matters, whilst other LPA structures maintain working in 'silos' with little co-ordination across sectors. Similarly, the structures of LPAs (i.e.

metropolitan and non-metropolitan counties or unitary authorities) will affect the remit of the respective authority, such as whether they have responsibility for infrastructure within the council, which will impact upon their relationship with a county council, or lack of relationship with neighbouring councils if they do have responsibility of infrastructure. Local circumstances and dynamics of internal structure affect the extent to which each LPA is set up to deal with different coastal matters. However, as iterated throughout this document, it is clear that working in partnership, through consultation with stakeholders before, during and after formation of a CCMA is a vital ingredient to successful adaptation. Similarly, as stated within Section 110 of the Localism Act 2011, it is a legal requirement to co-operate with neighbouring authorities when formulating planning policy.

The national, regional, local and neighbourhood administrations listed below help to form the different organisational structures that exist along the coast. A variety of powers exist within their remits. A more integrated approach helps to develop more joined-up thinking across a variety of geographic scales and disciplines, thus helping to form more locally-specific adaptation approaches. It can also help where the capacity and resources of organisations is limited. The following organisations and their involvement in coastal change matters are important in developing adaptation approaches:

- **National Administration;** Environment Agency, UK Government, Natural England, Defra, DCLG.
- **Regional Administration;** County Councils, Unitary Authorities.
- **Local Administration;** Local Councils, Voluntary Groups (e.g. Local Conservation Bodies), Marine Management Organisation, Partnerships – collaborative organisations (Local Economic Partnerships, Councils, Local Businesses, Pressure Groups etc), AONB Management Groups, National Parks.
- **Neighbourhood Administration;** Town Parish Councils / Neighbourhood Forums, Landowners (e.g. National Trust, Crown Estate, RSPB, Network Rail, English Heritage, Private Estates).

Similarly, the development and implementation of CCMA's and adaptation approaches must consider interactions with a wide range of other legislation and policy outside of the planning remit as exemplified by the case study in **BOX 7**. **BOX 8** lists suggested strategic and administration adaptation approaches ideas.

#### **BOX 7, Case Study Summary: Towards an Integrated Coastal Zone Management on the Manhood Peninsula**

Historically the Manhood Peninsula has experienced considerable coastal change.

The Chichester CCP project included exploration of ICZM in the context of planning and coastal change with the initial step of developing a working partnership between all parties. The objective was to achieve sustainability in the face of climate change and consequent coastal change. It developed an ICZM spatial policy for inclusion within the Core Strategy for the Chichester District focussing on a 'sense of place' for the peninsula. Additionally, an ICZM spatial plan (recommended to be a material consideration in planning) was produced for the peninsula, suggesting management options for the coastal zone from a number of perspectives. An ICZM workshop was undertaken to examine coastal and land based policies in the area to feed back local experience to Defra about successes and failures in these areas. See **Appendix A** for the full case study.

**Key lessons learnt** were that an integrated approach is essential to the

delivery of coastal management, but that also partnership working creates an all encompassing 'joined-up approach'.

#### **BOX 8: Strategic and Administration Adaptation Ideas**

Appoint 'coastal development officer' to act as a single point of contact/focus to drive integrated policy development across all sectors within the planning authority or other suitable organisation;

Integrate coastal management policies across sectors to manage future coastal change risks to different areas whilst exploiting opportunities that coastal change may bring in terms of multiple benefits. Note that the coast often passes through numerous authorities.

Integrate relevant teams/posts across an organisation so they sit within the same part of the organisation with much more direct and identical reporting lines to managers who can provide oversight and co-ordination of policies and initiatives for management of coastal issues.

Consider coastal management issues in local economic partnerships and Local Enterprise Partnerships and, therefore, develop a strategic approach through partnership-working.

Use area action plans/neighbourhood plans to manage future development in coastal communities at risk from coastal change.

Identify and set-aside in development plans areas of land needed to provide managed realignment in the future.

Ensure planning policies consider the long-term coastal change risks as well as short term needs of communities.

Develop coastal change adaptation plans for areas to mitigate the impacts of coastal change. These should have clear objectives against which progress can be measured and involve communities from the start.

Provide mechanisms for regular monitoring and review of actual coastal change experienced and modify adaptation plans etc as appropriate.

Develop a sound evidence base for the level of local risk and an understanding of which sections of the community are most exposed to this risk.

Ensure that infrastructure organisations and professionals have the right skills and capacity to implement adaptation measures.

If capacity is limited, work in partnership with neighbouring authorities or organisation to

pool limited skills and capacity, and use existing knowledge and capacity.

### 3.2 A planning response to adaptation

This section builds upon developing locally-specific adaptation approaches and discusses how these can be delivered through planning policy and development management.

#### 3.2.1 Planning policy examples

The NPPF sets out the Government's planning policies for England. It must be taken into account in the preparation of local and neighbourhood plans, and is a material consideration in planning decisions. Specific to CCMA's, Paragraph 106 of the NPPF states that Local Planning Authorities (LPAs) should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical change to the coast. As such, the following contains good practice examples of planning policy in relation to CCMA's and coastal change from recently

35

adopted local plans in relation to some of the adaptation approaches identified in **Table 2**. In addition to options for various adaptation approaches, the text below offers examples of instances in which policy has been devised to tackle adaptation. It should be noted that the identification and formulation of CCMA's can occur through the development of the Local Plan, or the development of separate planning policy devised to guide development along the coast.

A key question in guiding potential CCMA's in undertaking this part of the process is:

1. How can your locally-specific adaptation policies be implemented through planning policy?

##### 3.2.1.1 Local Plan Policy

###### **Roll Back or Relocation of Property**

Rollback or relocation of property, community facilities and infrastructure has been identified as a suitable adaptation approach to coastal change by both East Riding of Yorkshire and North Norfolk Councils. As outlined below, planning policy can also be used to identify suitable types of time-limited development for particular locations:

The main issues of coastal change in East Riding of Yorkshire are the rate at which the authority's clay cliffs are receding, along with the need to secure partnership funding from a variety of sources to maintain defences in the future. Coastal defences protect approximately 60,000 residents living in the authority's coastal zone. In contrast, approximately 86% (73km) of the coastline is undefended and so able to continue to erode naturally. The ongoing coastal change means that, at different points in time, residents are required to relocate away from unsafe coastal properties to safe accommodation further inland (not necessarily a coastal location). In response to these issues, the Council developed the concept of 'rollback' facilitating relocation further inland (see **BOX 9**).

### **BOX 9, Case Study Summary: East Riding of Yorkshire Council**

East Riding of Yorkshire Council developed the concept of 'Rollback' to address the impact of coastal erosion upon caravan parks (2003/2004), and farms/homes (2005). 'Rollback' looks at how properties can be moved inland away from the threat of coastal change whilst improving the quality of the local environment and sustaining local communities. The Council assesses each application for 'Rollback' in order to establish the level of risk to the existing property and the suitability of the proposed 'Rollback' plot, based on the most up-to-date coastal monitoring information.

The 'Rollback' policies in effect allow planning permission to be granted for the re-building of structures at imminent risk from coastal erosion in areas where it otherwise would not be granted (due to sensitivity in environmental and/or planning terms). Whilst 'Rollback' can therefore present a challenge to local forward planning policy by seeking locations for new (replacement) buildings in open countryside, it continues to be emphasised in national coastal change policy guidance as a sustainable alternative to hard-engineered coastal defences in areas under 'No Active Intervention' policies in Shoreline Management Plans.

The Council's 'Rollback' planning policies were supported by regional and national policy documents including the UK Government's Sustainable Development Strategy, the Regional Sustainable Development Framework, Planning Policy Guidance Note 20 (PPG20), Planning Policy Guidance Note 21 (PPG21), Planning Policy Guidance Note 12 (PPG12), regional and local economic development strategies, the East Riding of Yorkshire Community Strategy, and national and local Biodiversity Action Plans. The 'Rollback' policies are now being incorporated into the emerging Local Plan, to reflect the Council's ongoing, integrated approach to coastal management with a focus upon the social, environmental and economic issues associated with coastal change. See **Appendix A** for full case study.

**Key lesson learnt** was the risk-based approach to providing practical support and guidance to coastal communities affected by coastal change.

Similarly, North Norfolk's Core Strategy<sup>13</sup> was adopted in 2011 and contains two policies relevant to coastal change, EN11 and EN12. A full case study is included in **Appendix A**.

Based upon evidence in the SMP2 and as gathered through stakeholder engagement activities, North Norfolk District Council identified Coastal Erosion Constraint Areas (Policy EN11) through its core strategy. The policy is designed to discourage

<sup>13</sup> *North Norfolk Core Strategy*, North Norfolk District Council (2011).

development within these areas unless it can be demonstrated that it will result in no increased risk to life or any significant increased risk to property. A separate guidance note (*Development and Coastal Erosion*) was published to provide clarity about the implementation of Policy EN11 and guidance on the nature of development that is likely to be appropriate within the Coastal Erosion Constraint Area. In particular, this guidance states that temporary development may often be considered as an appropriate response to coastal change because it can help the community to 'gain time' to enable adaptation. Changes in use (e.g. from residential to employment related) of existing buildings may also be another means of enabling adaptation as they can be time-limited.

To enable adaptation in advance of the actual loss of property and to minimise the potential effects of blight, North Norfolk District Council also developed Policy EN12 to help facilitate 'roll back' of development in risk areas to 'safer' areas inland. In support of the implementation of these policies, North Norfolk District Council provides site-specific vulnerability reports for house purchases.

#### **Avoid Development in Vulnerable Areas**

Waveney's District Council's Core Strategy<sup>14</sup> was adopted in 2009. Policy SC03 deals with both flooding and coastal erosion, and sets out a sequential test for areas at risk from flooding. Specific to coastal erosion, it states that '*proposals should similarly avoid areas at risk from coastal erosion and ensure they are compatible with the appropriate Shoreline Management Plan. Proposals close to cliff edges or existing coastal defences will be required to undertake a risk assessment.*' The policy is an example of the use of planning policy in guiding development to suitable locations, and therefore avoiding development in vulnerable areas.

#### **Ensure new development does not cause adverse effects**

Purbeck District Council's Local Plan<sup>15</sup> was adopted in 2012. As explained below, the use of coastal instability identified from the Shoreline Management Plan has both helped avoid development in vulnerable areas, but also ensured that new development does not cause adverse effects or transfer coastal change risks to other areas.

A coastal erosion policy is written within Policy CE. The policy is specific to land instability and notes that '*unstable coastal land is often the result of the geology and hydrology of the coastline, predicted rising sea levels and changing management practices.*' It states that new development should not risk subsidence or aggravating existing coastal instability and sets a twofold test. The policy utilises Indicative Erosion Zones from the Shoreline Management Plan as a constraint for new residential development, and also a spatial constraint in relation to new development and a 'No-water discharge consultation zone' in relation to ensuring the stability of nearby cliffs.

<sup>14</sup> *The Approach to Future Development in Waveney to 2021, Core Strategy*, Waveney District Council (2009).

<sup>15</sup> *Planning Purbeck's Future, Purbeck Local Plan Part 1*, Purbeck District Council (2012).

The identification of CCMA's is noted as requiring further geological investigation and consideration through the Swanage Local Plan, neighbourhood plans, or the Site Allocations Plan. CCMA's will be a material consideration in the determination of planning applications.

#### **Resilience Measures**

In cases where relocation is not possible, encouraging resilience measures to property and infrastructure may be a viable alternative. The use of planning policy in guiding this is exemplified by New Forest District Council.

New Forest District Council's Core Strategy<sup>16</sup> was adopted in 2009. Policy CS6 related to flood risk including coastal protection. It states that flood risk will be taken into account at all stages in the planning process to avoid inappropriate development in areas at current or future risk from flooding, directing '*development away from areas of*

*highest risk in accordance with the sequential test*'. It notes that, providing a set of criteria is met, developments which provide regeneration benefits may be permitted on previously developed land within defined settlements which is at risk from flooding. Two of the criteria include incorporating appropriate flood resilience and resistance measures into the scheme and appropriate flood warning and evacuation plans are in place.

**Managed Realignment and Restoring Habitat**

As identified in **Table 2**, adaptation approaches to coastal change could include managed realignment to manage coastal change, working with natural process and restoring habitat. The removal of defences to restore natural process and make use of the natural environment may by a suitable form of adaptation to coastal change in particular circumstances.

New Forest District Council's Core Strategy<sup>17</sup> was adopted in 2009. Policy CS6 related to flood risk including coastal protection. The policy, in addition to the above, also covers the issue of developer contributions, which *'may be required towards publicly-funded flood alleviation schemes'*. The policy also discussed a sustainable and practicable approach to coastal protection and flood defence consistent with predicted sea level rise and increased river flows arising from climate change. *'This will include identification of opportunities for managed retreat of the coastline where defence is no longer the most economic or environmentally sustainable option, or to provide for replacement habitats in mitigation for continuing to maintain some of the sea defences along the district's coastline.'*

3.2.1.2 Local Plan Policy Monitoring

As illustrated above, policies to manage coastal change will also need monitoring arrangements to gauge their effectiveness and to ensure they are delivered on the ground through development management. **Table 4** below provides examples of potential targets and indicators. The table has been produced in order illustrate

<sup>16</sup> Core Strategy, New Forest District Council (2009).

<sup>17</sup> Core Strategy, New Forest District Council (2009).

particular examples, however both targets and indicators for targets need to be individually devised based on planning policy specific to a local authority.

*Table 4 Example target and indicator for monitoring planning policy that should be tailored to specific local policy*

<b>Example Target</b>	<b>Example Indicator for Target</b>
No new developments in areas where coastal protection is required	Number of new developments (by type) in areas where coastal protection is required.  Permissions granted in areas at risk of flooding or coastal erosion contrary to Environment Agency or coastal protection advice.  Number of permissions for relocation of properties that are at risk from coastal erosions.  Developments refused because of coastal erosion.
Minimise the risk of flooding and coastal erosion	Number of proposals or % in CCMA's permitted on a time-limited consent.  Number of permissions incorporating SUDS schemes.  Number of dwellings permitted in the 100 year coastal erosion zone.  Number of permissions for relocation of properties that are at risk from coastal erosions.

	Properties at risk of flooding.
	Developments refused because of coastal erosion.
	Incidence of flood watches and warnings.
	Permissions granted for coast protection / flood defence works.
Not to allow, contrary to Environment Agency comments in relation to planning applications, development in areas at risk from flooding, or which would threaten water quality.	Number of new developments (by type) in areas where coastal protection is required.
	Permissions granted in areas at risk of flooding or coastal erosion contrary to Environment Agency or coastal protection advice.
	Developments refused because of coastal erosion.

### 3.2.1.3 Supplementary planning documents (SPDs)

In addition to producing local planning policy, further guidance can be provided to expand on policies included in the Local Plan. This can be produced through supplementary planning documents (SPDs). SPDs are defined in the NPPF as *'documents which add further detail to the policies in the Local Plan. They can be used to*

40

*provide further guidance for development on specific sites, or on particular issues, such as design. Supplementary planning documents are capable of being a material consideration in planning decisions but are not part of the development plan'.* This is an approach the Isle of Wight Council is taking.

Whilst not produced as of yet, Isle of Wight Council has laid out its intentions to produce a Flood Risk and Vulnerable Coastal Communities SPD. The document will set out how the council will address flood risk that faces the Island. The planned production of the SPD has been written into the recently adopted (2012) Island Plan<sup>18</sup>. Policy DM15 of the plan sets out the Council's approach to managing development in coastal areas affected by coastal change, explaining that the Council will identify CCMA's within the SPD. Subsequently, the policy outlays criteria which development proposals will be expected to meet. Of particular note is Part 1 of the policy which lays out criteria that both the Council and the Environment Agency must be satisfied with. This notes the importance of collaboration and partnership with other stakeholders, particularly where skills and capacity may be limited within an authority.

The following case study (**BOX 10**) from West Dorset District Council and Weymouth and Portland Borough Council shows how the production of a planning guide (in this case an internal one) can be a useful tool for those involved with planning for coastal change.

#### **BOX 10, Case Study Summary: West Dorset, Weymouth & Portland Coastal Risk Planning Guide**

In 2012 the Council developed internal coastal risk guidance for both planners and engineers on the nature of risks posed to coastal areas from future coastal change. It provides consistent advice for informing planning applications requirements and decisions as well as the informing of future development in CCMA's. The document identifies risk zone areas for each section of the coast where there are projected adverse impacts and consequences to which particular consideration should be given during the planning process. Each section at risk includes a map, description of the section of coast, the relevant SMP policy, a description of the nature of the coastal change risks, the assets likely to be affected and recommendations for development management.

The development of the coastal risk planning guidance took a staged approach. The first stage involved reviewing the SMP policies and supporting information to the SMP to identify the nature of the coastal change risks for each section of coast. Having identified the nature of the risks, the second stage was to map the hazards. From this it was then possible to identify areas of current or future planned development that are at risk from the coastal change hazard(s) in each area, as well as determine what types of development should or should not occur in each area of risk depending on the nature of the coastal change hazard posed. See **Appendix A**, for the full case study.

**Key lessons learnt** were that the staged approach was found to provide a robust and auditable approach to developing the guidance.

#### 3.2.2 Development management considerations

Planning policy, whether through the Local Plan or SPDs, needs to be delivered on the ground within local authorities. Monitoring of policy with targets and indicators is a measure of the effectiveness of devised policy, and as such development management has an important role to play in ensuring targets are met – particularly given that we work in a plan-led system.

Through being pro-active in development management, both applicants and local authorities can ensure their duty to comply with Paragraph 187 of the NPPF. Paragraph 187 states that '*local planning authorities should look for solutions rather than problems, and decision-takers at every level should seek to approve applications for sustainable development where possible. Local planning authorities should work proactively with applicants to secure developments that improve the economic, social and environmental conditions of the area*'. Responses such as the following help to ensure this compliance:

- Design moveable community infrastructure.

- Encourage new developments to incorporate green space to help manage future coastal change risks.
- Introduce resilience measure to property and infrastructure. To support this, provide advice to developers / property owners / businesses on the measures they can take. Measures to consider include modifying doors, windows, floors, electrics, raising land / property levels and deploying sustainable drainage systems more widely.
- Ensure new development does not cause adverse effects or transfer coastal change risks to other areas.

Table 5 below provides some further guidelines for delivering adaptation through development management.

Table 5 Development management considerations

Mechanism	Details
Validation list	<p>The use of up-to-date validation lists is an important tool in ensuring sufficient and relevant information is attained for proposed developments in CCMA's. A recent update to the Development Management Procedure Order<sup>19</sup> (Article 9 and 29) has brought it in line with the NPPF (paragraph 193) which states that local lists should be reviewed 'on a frequent basis'. The updates require local authorities to update their lists at least every two years, ensuring they are more robust and justified.</p> <p>An example of this is the Purbeck District Council Validation List<sup>20</sup> which includes a requirement for a Land Stability Assessment in areas of coastal instability. 'Development proposals will need to demonstrate proper investigation of ground conditions, the impact of any development activities, including services provision, and measures to ensure that any construction works will not result in the loss of ground stability on the site and adjoining land.' The inclusions of the assessment on the list is important given the localities of Purbeck on the coast and issues of coastal erosion as identified within the local planning policy discussed in Section 3.1.1.3.</p>

Required Information The Growth and Infrastructure Bill, which was introduced to Parliament on 18<sup>th</sup> October 2012, includes measures which will place limits on the powers of local authorities to

<sup>19</sup> A recent update to the Development Management Procedure Order – Streamlining information requirements for planning applications consultation, Government Response, DCLG (2012).

<sup>20</sup> Validation of Planning Applications, Dorset for You (2007).

Mechanism	Details
	<p>require information with planning applications by stipulating that such requests must be genuinely related to planning and reflect the nature and scale of the development proposed. Consultation<sup>21</sup> has now been released allowing applicants to challenge the need for certain required information, as such it is important that</p>

only necessary information is requested (like the Purbeck example above).

Information required should be proportionate to vulnerability and scale of impact, but applications should also not be validated without the necessary information. Types of information required may include; Geotechnical Assessments (Land Stability Assessments), Vulnerability Assessment and Flood Risk Assessments. The list is not definitive.

Conditions	<p>Conditioning through development management is a useful tool ensuring that an impact can be made acceptable, however it is not always suitable to use a condition and any condition imposed should meet the six tests for conditions set out in Circular 11/95<sup>22</sup>.</p> <p>Opportunities to condition the provision of additional necessary information include requiring geotechnical studies (if not already received due to a requirement of a validation list), habitat mitigation methods, construction mitigation methods, imposition of resilient designs such as SUDS (if not already included in the application) and the use of time limiting conditions when considering the rates of erosion. Again, the list is not definitive.</p>
Decisions	<p>In making decisions and preparing potential developments it will be important to avoid applications that foreclose or limit future adaptations or restrict adaptive actions for others. Key to this is understanding the physical processes, how they relate to coastal change risks and how they may change over time.</p>
Consulting	<p>Consulting with the stakeholders is vital in any part of development and planning. It will be important from the</p>

<sup>21</sup> *Streamlining the planning application process, Consultation*, Department for Communities and Local Government, January 2013.

<sup>22</sup> *Circular 11/95: Use of Conditions in Planning Permission*, Department of the Environment (DoE), 1995.

## Mechanism

### Details

outset of a proposed development, or when approached by an applicant, to hold early discussions or indicate what key concerns may be or what information is likely to be required to validate the application.

Consulting with the public is also a vital part of ensuring that the correct facts are known and that individuals are aware of the details of the application. The development management process encourages pre-application consultation and the Government is proposing to make this a statutory requirement for major developments. There are potential benefits to developers of undertaking a public consultation exercise prior to the submission of an application and in the initial design phase of a project.

Stakeholders and consultees are also important in ensuring information obtained through the development management process is addressed correctly. Pro-active consultation with consultees can ensure development takes place in a suitable location and suitable conditions are imposed, they also offer useful knowledge particularly

when skills and capacity of local authorities can be limited.

With reference to Table 5, a key question in guiding potential CCMA in undertaking this part of the process is:

1. Based on these policies what development management amendments are required?

## 4 Key Questions in Aiding Development of CCMA through the Staged Process

The following concluding section takes on board what has been discussed in the preceding Sections 1 to 3 of this guide. For each stage of the process a set of key questions has been included in order to guide LPAs in devising potential CCMA and delivering adaptation approaches for them through planning policy and development management.

The questions should be used as a starting point of developing CCMA for LPAs in consultation with relevant partnerships, stakeholders and the local community. In order to be successful, and ensure local solutions and approaches are established, consultation should be undertaken before, during and after each stage.

### 4.1.1 Stage 1: Reviewing SMP Policies

#### Questions to consider for Stage 1

1. Is the SMP policy not to defend the coast (NAI)? If yes, a CCMA may be a useful approach. See **Section 2.2** for more information.
2. Is the SMP policy to implement managed realignment of a section of coast? If yes, a CCMA may be a useful approach. See **Section 2.2** for more information.
3. Will shoreline change be significant over the next 100 years? For example, will it have an important impact on development or land use economically, socially or environmentally? If yes, a CCMA may be a useful approach. See **Section 2.2** for more information.

If the answer is yes to any of the three questions, proceed to Stage 2.

If the answer to these three questions is no, then reference should be made to the FCERM Appraisal Guidance<sup>3</sup> to develop coastal risk management measures, alongside undertaking ongoing monitoring and review of policy.

### 4.1.2 Stage 2: Identifying Risk

#### Questions to consider for Stage 2

4. What physical setting does the proposed CCMA fall into? See **Section 2.3.1.1** for more information.

<sup>23</sup> FCERM Appraisal Guidance, Environment Agency, March 2010. Available online: <http://www.environment-agency.gov.uk/research/planning/116705.aspx>.

#### Questions to consider for Stage 2

5. Does the proposed CCMA cover more than one physical setting? If yes, it may need to be flexible in drawing on adaptation approaches and planning responses. If no, the approach is likely to be a singular response. See **Section 2.3.1.1** for more information.
6. What features, assets and land uses are within the proposed CCMA boundary? See **Section 2.3.1.2** for more information.
7. Are there any features, assets or land uses from neighbouring authorities that should be considered or will impact or be impacted upon by coastal change in the potential CCMA? See **Section 2.3.1.2** for more information.
8. Are there any planned and future developments that may be affected by the CCMA? For example, are there any recently-approved planning applications, employment or housing allocations within adopted Local Plans, or forthcoming infrastructure identified in the infrastructure delivery plan? See **Section 2.3.1.2** for more information.
9. Are there any planned and future developments from neighbouring authorities that should be considered or will impact or be impacted upon by coastal change in the potential CCMA? See **Section 2.3.1.2** for more information.
10. What factors influencing coastal change risk are relevant to the context, assets, features and land uses of the proposed CCMA? Consider specific flood risk, funding, land and property management and managed realignment risks. See **Section 2.3.2** for more information.
11. What are the types and current levels of coastal erosion and / or accretion to the potential CCMA? See **Section 2.3.2.5** for more information.

#### 4.1.3 Stage 3: Mapping Areas of Risk

##### Questions to consider for Stage 3

12. Which risk zone mapping approach is most suitable to local circumstances and context of coast in proposed CCMA? See **Section 2.4** for more information.
13. Do CCMA boundaries need amending from the risk zones in order to avoid cutting through settlements or transport infrastructure etc. or to allow for roll-back, relocation or diversion of infrastructure?

## 4.1.4 Stage 4: Delivering Adaptation through Planning

**Questions to consider for Stage 4**

14. Using Table 2, what may be a suitable adaptation approach based on the answers to questions 4 and 5? See **Section 3.1** for more information.
15. Have the benefits of the proposed approaches been identified as per the matrix in Section 3.1.1.1? Could you make this matrix specific to your local authority area? See **Section 3.1.1.1** for more information.
16. What funding is available in the proposed CCMA in relation to the proposed adaptation approaches answered to in question 14? See **Section 3.1.1.1** for more information.
17. What is the likelihood of attaining funding towards adaptation? See **Section 3.1.1.1** for more information.
18. How can opportunities be maximised? See **Section 3.1.1.1** for more information.
19. What communities are within the CCMA? Need to consider social factors including deprivation levels and public awareness of coastal change management issues locally (see Table 3). See **Section 3.1.1.2** for more information.
20. What are the barriers to engagement of the communities identified in question 19? How can these be overcome? See **Section 3.1.1.2** for more information.
21. What are the organisational structures of the proposed CCMA and local authority e.g. unitary or metropolitan? See **Section 3.1.1.3** for more information.
22. What other organisations can or should be involved? Which key stakeholders need to be involved in developing the CCMA? See **Section 3.1.1.3** for more information.
23. How can this be maintained to ensure an effective CCMA? See **Section 3.1.1.3** for more information.
24. Based on preceding evidence and ongoing consultation, what potential uses would and would not be acceptable within the CCMA?
25. How can your locally-specific adaptation policies be implemented through planning policy? See **Section 3.2.1** for more information.
26. Based on these policies what development management amendments are required? See **Section 3.2.2** for more information.





## Appendix A Case Studies

A-1

<b>Case study</b>	<b>A useful study for</b>	<b>Page</b>
1. Alde and Ore Futures	Partnership working; community led planning; funding streams.	A-2
2. Cowes to Gurnard, Isle of Wight	Assessment of coastal instability and how this links to planning policy and development management.	A-5
3. East Riding of Yorkshire Council	Planning policy for facilitating rollback and relocation in areas at risk of erosion.	A-7
4. Manhood Peninsula – Towards ICZM	An integrated coastal management approach identifying management options for the coastal zone from a number of perspectives	A-12
5. North Norfolk District Council	A range of approaches to support continuity of community and address coastal change. Approaches include; a 'buy to let' approach; replacing damaged infrastructure; links to SMP to define at risk areas and areas appropriate for development.	A-17
6. Reculver Masterplan	Integrated planning including; regeneration; managed realignment SMP policy in a way that creates habitat and benefits tourism.	A-19
7. South Milton Sands, Devon	Sand dune/habitat restoration; relocation of car park; tourism/recreation access; community involvement; removal of defences.	A-21
8. Steart Coastal Management Project	Extensive engagement with stakeholders to develop design and achieve planning consent to deliver habitat creation scheme.	A-24
9. West Dorset, Weymouth & Portland Coastal Risk Planning Guide	Example of using SMP, NCERM and Flood Mapping to identify coastal change risks along all parts of the coast. Includes development management recommendations and requirements for information to be provided to support planning applications.	A-26

A-2

# Alde & Ore Futures - Overview

## How did it start?

Alde and Ore Futures was a community-based approach to tackling a range of issues affecting communities around the Alde and Ore Estuary from housing through to estuary and coastal defences. The project covered an area of 18,000ha with approx 10,000 residents. It was set up in September 2009 building on the unhappy lessons learnt from another Suffolk estuary. This aimed to get people talking to each other – local people, landowners, parish and district councils, government and wildlife bodies about the future sustainability of communities around the estuary.

Local people had been raising concerns such as:

- What was the future for the 42 kms of river walls within the estuary?
- Would the sea break through the defences at Slaughden or other vulnerable sites?
- What would the consequences be for the people who derive huge pleasure from walking around the estuary, sailing on it or simply admiring its ever-changing landscape?
- What would be the impact on those who make a living from the estuary or have property in the area which lies behind its defences?

The idea was to get those affected by decisions about the future to become part of how decisions are made in their community. One of the benefits of this project has been the chance to get a broader and much more inclusive view. By enabling local people and agencies working together, often for the first time, the Alde and Ore community is coming up with innovative solutions to problems that initially seemed intractable. More than 1,800 hours of community time has been contributed, through for example increasing community resilience and emergency planning, landowner forums around future maintenance and contributing to the framework for action.

## Who was involved?

Alde and Ore Futures pilot project was set up to develop an integrated approach to managing an area around the Alde and Ore estuary through a partnership between the local communities, local authorities and Government agencies. It included working groups of local landowners, community organisations, representatives of the environment recreation and access interests, businesses and artists, the local Estuary Planning Partnership, Alde and Ore Assn, National Trust, EA, Natural England, County Council, AONB Unit and the District Council.

## What did we do?

The working groups made up of and chaired by local people explored a range of issues facing the community and the conclusions were then shared through a number of ‘drop-in events’ to gain feedback from the wider community. This method of community engagement worked particularly well. Following a review of progress made so far a Big Conversation was launched in the summer of 2011 to develop a dialogue about these issues on a much wider basis. This was a culmination of the ideas, comments thoughts and issues generated by two community conferences, local meetings, workshops and conclusions and recommendations of the topic groups. The conversation was split across three themes to allow people to focus on what was important to them. These themes were:

- Managing the coastal environment
- Thriving and viable communities
- Building the local economy

Over the summer months the project members spoke directly to over 900 people, handed out more than 1100 booklets and questionnaires and received about 300 responses.

A-3

The responses gave the team plenty to work on. The key themes that they identified were:

### Managing the coastal environment

- Maintenance of existing walls
- Funding of future works
- How governance will work
- An overarching plan for the estuary

### Thriving and viable communities

This community group are taking an overall view of the management of flood defences in their community. Positive action is already being taken with a landowner and the Internal Drainage Board working in partnership to repair 400m of estuary wall funded by the landowner.

### Alde Ore Estuary Partnership

The Alde & Ore Estuary Partnership (AOEP) is a ground breaking initiative. Although the

- Community and emergency planning
- Use of the area for recreation and enjoyment

Building the local economy

- Businesses need to work together
- Broadband and mobile phone access
- Emergency planning

### Where are we now?

The Big Conversation generated more than 300 responses many of which were critical of aspects of the work. However this response directly determined the development of the Framework Plan for the estuary. Full details of the project including the responses to the Big Conversation and the action plan can be found at [www.suffolkcoastfutures.org.uk](http://www.suffolkcoastfutures.org.uk).

The project has also helped to establish contacts and re-energise activity highlighting the estuary and its importance to the local community and businesses

The biggest concern highlighted locally however has been the future capability of the estuary flood defences which appeared to have little local involvement. The Futures project worked directly with the Steering Group, the Estuary Planning Partnership, the Alde and Ore Association and the Environment Agency to develop an entirely new approach enabling a local representative group to oversee a strategy for the estuary with the overall purpose to ensure the development of a safe, secure, productive and pleasant estuary. The Alde & Ore Estuary Partnership was launched on 17 May 2012 with an address by Richard Benyon MP.  
<http://www.youtube.com/embed/CNsETJJBVhQ?rel=0>

Environment Agency will continue to have responsibility for flood defence, in the main the overall view is being handed back after many years from national to local level. Membership of the new Alde & Ore Estuary Partnership will be an important and influential group, making significant decisions about the future of the estuary. The main tasks of the Alde and Ore Estuary Partnership will be to:

- Develop a **strategy** for flood defences for the whole Estuary
- Create a **programme** of maintenance work for the furtherance of the whole estuary strategy i.e. which defences should be maintained or improved, to what standard, and in what order
- Ensure that the **funds** are raised, from national and local sources, to pay for the agreed programme
- Oversee the **delivery** of this programme of work. The Partnership will not itself undertake the necessary engineering and administrative tasks, but will commission them from others

In addition the new AOEP will now have a central role within the wider Suffolk Coast Forum ensuring that the communities around the Alde and Ore have a voice at a Suffolk wide strategic body.

### What happens next?

The Futures project closed on 17 May 12 at a public meeting with the launch of the new Alde and Ore Estuary Partnership. The Futures project itself will conclude with the following items:

- Framework Action Plan that will be finalised with actions to be taken on by the new AOEP.

A-4

- A summary of the Futures process
- Case studies of parts of the Futures project including lessons learnt
- '10 year look forward' a document produced by the Environment Agency outlining the current standard of protection and an estimate of what actions the Environment Agency are likely to be undertaking over the next few years that acts as a baseline for future decisions to be made by the AOEP.
- Website access to the key flood and coastal erosion risk management documents that form the core basis for future decision making within the estuary in flood risk management.

Therefore whilst the project is closing there will be a real legacy for the local communities as the new organisation takes the lead on such an important issue locally.

### Hints and Tips

- Engaging early will often lead to you being

criticised for not knowing the answers but is essential for **building trust**

- Share objectives means **shared solutions**
  - you can't do it all by your self
- True partnership working demands time, resources and isn't easy. You have to **take risks** – it will be scary at times.
- Solutions to problems can often be **found locally**, but you have to enable them to come forward.
- **Work wider** than just the specific site of concern then you discover the local links that will enable you to meet local needs and local raise funds.

For information relating to Alde & Ore Futures contact: Bill Parker, Coastal Management  
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A-5

## Case Study: Cowes to Gurnard, Isle of Wight

### 1. Location

Prior to the 16<sup>th</sup> century little is known of the history of Cowes except that it was a port where some shipbuilding was undertaken. By the 18<sup>th</sup> century the shipbuilding industry was well established and naval vessels were built along with other ocean craft. During the 19<sup>th</sup> century, Cowes became popular as a centre for bathing and sailing and the Royal Yacht Club was formed in 1817. As the Royal Yacht Club grew in importance, so did Cowes. Development of the waterfront was haphazard and little attention was paid to public health and sewerage at the time. Today, Cowes is the world's leading yachting centre and Cowes week is the culmination of the yachting calendar, attracting many seasonal visitors to the town.

Gurnard is located to the west of Cowes seafront and comprises mainly bungalows, chalets and holiday accommodation. The coastal slopes at Gurnard have attractive views of The Solent and the Hampshire mainland. The resort attracts seasonal visitors but the settlement largely comprises private homes.

The north-facing coastal slopes extending from Cowes to Gurnard are the most northerly landmass of the Isle of Wight. The coastal slopes form a prominent headland separating the Medina River and Estuary from the western Solent. The headland is characterised by a plateau forming the higher ground above gently sloping coastal cliffs of varying height up to 35m.

The character of the coastal slopes within this area varies along the shoreline. From Market Hill to the Royal Yacht Squadron, Cowes, steep estuary slopes up to 20mAOD form the northwest shore of the Medina River. From the Royal Yacht Squadron to Egypt Point and beyond to Gurnard Green, the coastal slopes rise gently to 35mAOD. A stream valley intersects the shoreline at Gurnard Green, beyond which steep coastal slopes known as Gurnard Cliffs extend to Gurnard Marshes at the western edge of the study area. Gurnard Cliffs vary in height up to 35mAOD.

### 2. Coastal Change Issues

The coastal slopes between Cowes and Egypt Point have, historically, been extensively developed for residential, leisure and retail purposes. Initially, development was focused at Cowes on the more accessible gently sloping ground. As the demand and opportunities for development sites increased, developed spread further west towards Gurnard. Other sites have been redeveloped with multi-storey flats or detached homes. The spread of development has, in places, occurred on steeper ground of marginal stability. This has led to an apparent increase in the number of reported problems of ground instability. The problems have been heightened in recent years as a result of several slope failures caused by construction activities.

### 3. Adaptation Measures Taken

In the year 2000, the Centre for the Coastal Environment of the Isle of Wight Council commissioned a coastal slope stability study at Cowes and Gurnard.

The main objective of the study was to provide general guidance and information on ground stability conditions along the coastal frontage from Market Hill, in central Cowes, west to Gurnard Marsh, and north of Baring Road located along and above the coastal slopes. Specifically, the study brief required the preparation of a series of geomorphological, ground behaviour and planning guidance maps following the format of an earlier landslip potential study at Ventnor on the south coast of the Isle of Wight. The series of maps are intended to assist decision-making by informing the planning process as well as provide a basis for assessing the requirements for stability investigations and reports in support of future development proposals in the study area.

The study brief specified the following tasks:

A-6

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## Page 70

- A review of readily accessible information sources, including published literature, technical reports, geological and topographic maps and plans, and historical prints and photographs.
- Interviews with the Isle of Wight Council Coastal Manager, Planning and Building Control Managers, and up to four local consulting engineers and surveyors.
- Engineering geomorphological mapping and survey of damage due to ground movement in accordance with the approach adopted for the Ventnor study.

Central to the approach developed by these studies is the need to:

1. Determine the nature and extent of unstable ground/landslide problems;
2. Understand the past behaviour of unstable areas;
3. Formulate a range of management strategies to reduce the impact of future ground instability.

Section 7 of the resulting report provides **planning guidance** for this complex area of coastal slope instability. This includes a **Planning Guidance Map** based on the assessment of ground behaviour and the variability in stability conditions across the study area and forms the basis of planning guidance. Guidance is provided on development plan policy and the control of development in areas subject to land instability. The map categorises the area according to the degree of impact which slope stability considerations might have on development proposals. Five categories are distinguished:

- Area suitable for development
- Area likely to be suitable for development
- Area likely to be suitable for development with appropriate mitigation and stabilisation measures
- Area unlikely to be suitable for development
- Area unsuitable for development.

The Planning Guidance Map identifies areas where each of these five particular development controls will apply.

In summary, planning policy identifies that development in actively unstable areas, where ground movement will affect new development, should be avoided. Less unstable areas may be successfully developed, provided that the developer carries out appropriate mitigation and stabilisation measures. In areas subject to land instability, developers and homeowners must accept a higher level of commercial risk than would be expected in normal circumstances (provided that the risk is not associated with a significant safety risk). It is important in such cases, that prospective purchasers are made aware of the potential risks, along with their legal responsibilities with regard to safeguarding their property and neighbouring land from instability

Applications for developments which have no material effect on stability (e.g. minor developments and applications involving change of use only) will not normally be subject to these procedures, unless the change of use significantly worsens the consequences of any instability.

## 4. Further Information

Further information about this case study is available from the following sources:

- Halcrow (2011). *Coastal Instability and Erosion Management in Great Britain Good practice Guide*.
- Halcrow (2000). *Cowes to Gurnard Coastal Slope Stability Study Ground Behaviour Assessment*. Isle of Wight Council. August 2000.

## Case Study: East Riding of Yorkshire Council

### 1. Location

The East Riding coastline in the North-East of England is approximately 85 kilometres (53 miles) long and is characterised by a diverse range of landscapes and habitats. It stretches from the chalk headland at Flamborough with its important landscape and wildlife designations, through the Holderness plain which is subject to some of the highest rates of erosion in North West Europe, to the Humber Estuary. The coast is punctuated by the resort towns of Bridlington, Hornsea, and Withernsea, which are the main settlements, whilst numerous smaller communities also lie along its length. The coastline includes 9.3 kilometres of coastal defences which are maintained by East Riding of Yorkshire Council, plus a further 2.15 kilometres of privately-owned defences. Away from the main settlements, the East Riding coastline is predominantly rural.

Soft clay deposited after the last ice age makes up much of the East Riding coastline, leaving many areas exposed to the average erosion rate of 1.5 – 2.5 metres per year. In addition, isolated cliff losses can exceed 20 metres in some locations. The sediment released by erosion is transported along the coast in a southerly direction, being deposited to form beaches or washed to the south to feed Spurn Point, the Humber Estuary, and beaches further along the coast.

The East Riding has two stretches of Heritage Coast: Flamborough Head and Spurn. Flamborough Head is the most northerly outcrop of chalk in Europe and has national and international designations, including Special Area of Conservation and Special Protection Area. Spurn Point stretches southwards for approximately three and a half miles into the mouth of the Humber Estuary, with sandy beaches and the North Sea on its eastern side, and areas of salt marsh and extensive mudflats which attract thousands of birds on its western side. Whilst Spurn is a National Nature Reserve (NNR), Flamborough Head and the Humber Estuary are managed as European Marine Sites.

### 2. Coastal Change Issues

The clay cliffs of the East Riding of Yorkshire experience one of the fastest rates of coastal erosion in North-West Europe. Erosion is driven by wave attack at the base of the cliffs resulting in a series of small landslides. A significant extent of cliff may be lost in a landslide event after which no further loss will occur at that location for a period of time. Overall the coastline is eroding at an average rate of approximately 2 metres per year, although this is not a constant rate and localised losses have been higher.

Approximately 60,000 residents live within the coastal zone of East Riding, with the majority being within the defended frontages of Bridlington, Hornsea and Withernsea. The main issue in these areas is securing sufficient partnership funding from a variety of sources to make a contribution to funding from the Flood Defence Grant in Aid budget, in order to maintain defences in the future.

The majority (86% or 73km) of the East Riding coastline is undefended and so able to continue to erode naturally. These undefended stretches contribute to the character and landscape of this area, which relies significantly on tourism and is therefore of vital importance for the local and regional economy. There are also a number of properties and isolated communities located along these undefended sections of coast, and the high erosion rates put homes, farms and caravan parks at risk. Further social issues in these undefended locations are isolation due to remoteness; pockets of deprivation; an ageing population linked to the inward migration of retired adults; and the limited connection of coastal towns with their hinterlands.

In addition, coastal change means that, at different points in time, residents are required to relocate away from unsafe coastal properties to safe accommodation further inland. For particularly vulnerable and isolated residents, relocation is a significant cause of distress and the negative impacts upon their health and well-being may result in the need for additional support, for example from the Adult Services Team. The real risk to life associated with the continued habitation of cliff top properties means that residents typically request

### 3. Adaptation Measures Taken

In response to the threat to a significant number of dwellings that have been identified as being at risk of falling into the sea in the next 100 years, the East Riding of Yorkshire Council used the recommendations from their Integrated Coastal Zone Management Plan (adopted in 2002) to develop the concept of 'rollback' in relation to residential properties and caravan/holiday home parks. The intention being to facilitate the relocation of caravan parks inland, further away from the threat of erosion.

A set of guidelines, standards and policies were developed in 2003/4 to facilitate the relocation of residential properties and caravan/holiday home parks. The policy in effect allows planning permission to be granted in areas where it otherwise would not be granted (due to sensitivity in environmental and/or planning terms) for the re-building of structures at imminent risk of coastal erosion. This local planning policy was supported by regional and national policy documents including the UK Government's Sustainable Development Strategy, the Regional Sustainable Development Framework, Planning Policy Guidance Note 20 (PPG20), Planning Policy Guidance Note 21 (PPG21), Planning Policy Guidance Note 12 (PPG12), regional and local economic development strategies, the East Riding of Yorkshire Community Strategy, and national and local Biodiversity Action Plans.

The East Riding of Yorkshire Coastal Change Pathfinder Project (completed in 2011) tested ways of aiding the implementation of this policy. The overall purpose of the Pathfinder project was to take a risk-based approach to providing practical support and guidance to coastal communities affected by coastal change. Through the Pathfinder Project, East Riding of Yorkshire Council refined its approach to establishing the level of erosion risk to property. Used consistently in residential locations since 2009, the approach is based upon projections within the Flamborough Head to Gibraltar Point Shoreline Management Plan (SMP) and the Council's coastal erosion monitoring programme; officers use both erosion records and cliff line projections to assign one of the three risk levels – imminent, high or low - to individual properties in the coastal zone.

The Council's definition of imminent risk is based upon its records of maximum cliff losses from single events in all coastal locations. Therefore, a property/structure is at imminent risk (level 1) when it is within the maximum recorded loss distance of the cliff edge for its particular location. A dwelling at higher risk (level 2) is beyond the maximum annual loss distance for its particular location but within the area projected to be lost by 2025 based on cliff line projections within the SMP. Finally, a dwelling at lower risk (level 3) is located between the projected 2025 and 2055 cliff lines within the SMP. The consistent approach enables the Council to prioritise applications for advice and support based upon applicants' levels of risk, rather than their geographical locations. The successful approach will be embedded in the Council's Coastal Management Framework during 2013/14.

A range of adaptation measures, based on priority informed by the assessment of erosion risk and an assessment of residents' needs, were then tested as part of the Pathfinder project to give incentives to people living with the imminent threat of losing their home to relocate to safer and more sustainable areas.

### 4. Lessons Learnt

The overall purpose of the East Riding of Yorkshire Coastal Change Pathfinder Project was to take a **risk-based approach to providing practical support and guidance to coastal communities affected by coastal change**. As part of this, the East Riding of Yorkshire Council developed and adopted a **consistent definition of 'imminent risk'**. In previous years, the threatened properties had been identified on an ad-hoc basis, based on the advice given by the Council's coastal engineers. The new, adopted definition of 'imminent risk' is instead based on criteria which use the maximum annual loss for each specific coastal location. **This assessment of risk is updated on a six-monthly basis, informed by the latest monitoring data.**

A-9

As discussed above (Section 3), the baseline data used to develop the level of risk and eligibility criteria were informed by the Council's good practice coastal monitoring programme and the outputs of the SMP. Throughout the Pathfinder project, the monitoring information was considered and reviewed by a **cross-directorate Coastal Officers' Working Group, established to help embed an integrated approach to the management of coastal change across the Council**. In a demonstration of its success, the working group has been retained and continues to meet each quarter to discuss coastal change issues affecting local communities. The group's permanent members are officers and managers from the following internal teams: Building Control, Sustainable Development, Flood and Coastal Erosion Risk Management, Legal, Press and Communications, Public Protection, Housing, Highways, Private Sector Housing, and Development Control.

Rather than providing compensation for loss of property or land, the Pathfinder project **enabled individuals to adapt to the impacts of coastal change by accessing practical support and assistance**. These residents require additional support to that which is already available because there is a real risk to life if they continue to live in dangerous properties close to the cliff edge. Due to the sensitive and personal nature of relocation and property loss, there was a successful, **case-by-case approach to engagement with residents, supported by a dedicated Pathfinder project officer acting as a single point of contact for applicants**.

Early engagement with coastal communities also proved invaluable to the project's success, for example

enabling vulnerable residents' additional time in which to plan for their relocation, by joining the housing register at an early stage to increase their chances of receiving suitable accommodation offers. Some adaptation options included in the Pathfinder project support packages, including 'Buy and Lease Back', proved difficult to test within the Council's corporate structure and wider legislative and policy framework. Therefore, moving forwards, **it will be important for the limitations of adaptation planning options to be scoped out and relayed to interested parties at the earliest opportunity.**

## 5. Further Information

Further information about this case study is available from the following sources:

- Department for Communities and Local Government (2010). *Planning Policy Statement 25 Supplement: Development and Coastal Change Practice Guide*. March 2010.
- Department for Environment, Food and Rural Affairs (2012). *Coastal Pathfinder Review: Final Report*. January 2012.
- Department for Environment, Food and Rural Affairs (2011). *Coastal Pathfinder Evaluation: An Assessment of the Five Largest Pathfinder Projects*. November 2011.
- East Riding of Yorkshire Council (2011). *East Riding Coastal Change Pathfinder Feedback Report*. September 2011.
- East Riding of Yorkshire Council website: *Coastal Change – Getting Support*. Website address: <http://www2.castriding.gov.uk/coastalchangepathfinder/>. Date accessed: 24/01/2013.

A-10

# Case Study: Manhood Peninsula – Towards ICZM

## 1. Location

The Manhood Peninsula is a small, low-lying triangle of land on the south coast of England bordered by the open coast, Chichester Harbour and Pagham Harbour. Long hours of sunshine, a mild climate and open skies mean it has long been recognised as a desirable area to live, holiday, start up businesses and grow food.

## 2. Coastal Change Issues

Historically, the Manhood Peninsula has experienced considerable coastal change, including permanent inundation, land reclamation, erosion and coastal flooding. The risks from coastal flooding and erosion in the area are expected to increase in the next 25 years or so, and will be exacerbated by climate change.

The Manhood is also a fragile environment in need of an Integrated Coastal Zone Management (ICZM) plan to ensure it has a sustainable future.

## 3. Adaptation Measures Taken

The local community recognised the need for an ICZM approach in this area, and in 1997, two local residents approached Chichester District Council, West Sussex County Council and the Environment Agency – suggesting that a more integrated approach to planning, based on water management, was necessary for the peninsula's economic, social and environmental future survival.

This started a process that has literally put the Manhood Peninsula on the map in an international debate on both community-led planning and climate change mitigation. As a result of this community led initiative:

- the Manhood Peninsula Partnership (MPP) was created in 2001;
- the Manhood Peninsula has hosted two Dutch/Anglo spatial planning workshops;
- the MPP's work been a key component of two European Union funding bids for climate change planning strategies;
- the area has been recognized and awarded a DEFRA Coastal Change Pathfinder grant for working with

- coastal communities to plan for and adapt to coastal change;
- In 2008 local residents formed the Manhood Peninsula Steering Group (MPSG), a direct and spontaneous reaction to the (then) proposals for coastal defence; and
- Selsey Coastal Trust (Pre Trust Group at this stage) is investigating the feasibility of forming a Trust to help regenerate Selsey and put surplus income into sea defences.

The Chichester Coastal Change Pathfinder Project (completed in 2011) included exploration of ICZM in the context of planning for coastal change. The initial step in exploring ICZM within the Coastal Change Pathfinder Project involved developing a working partnership between residents, employers, coastal users and local government. The objective was to achieve sustainability in the face of climate change and consequent coastal change. The following approaches were pursued:

- Establishment of an ICZM group comprised of MPP members, local businesses, marine user groups, government bodies including Chichester District Council, the Environment Agency, Natural England.
- An ICZM spatial policy (SP14) for the Manhood Peninsula. SP14 has been suggested for inclusion within the Core Strategy of the emerging Local Development Framework for the Chichester District. Included are themes applicable to the whole of Chichester District, but compiled into a single document focussed on the Manhood Peninsula emphasising a 'sense of place' for the peninsula.

A-11

- An ICZM spatial plan for the Manhood Peninsula – *Towards ICZM*. This is the spatial plan suggesting management options of the coastal zone from a number of perspectives. It is similar in principle to a Village Design Statement for the peninsula, and comments on how the coastal zone affects/is affected by life there. Subject themes within the document are based on the Sustainable Community Strategy entitled 'Chichester, A Very Special Place'. It provides a summary of local opinion and expectation as depicted in Parish Plans, Village Design Statements, Conservation Area Character Appraisals (CACAs), and a number of other documents on which consultation has already taken place including the Pagham- East Head Coastal Defence Strategy and the North Solent Shoreline Management Plan. A workshop discussed many of these issues further.
- ICZM Workshop to examine coastal and land based policies in the area to feed back local experience to Defra about successes and failures in these areas. This event attracted nearly 60 participants. They were divided into a number of themed groups such as Transport and Environment, reflecting the concerns and aspirations for the Manhood Peninsula that were apparent in existing documents such as Going Dutch in 2001. For more details see the following page.

The Manhood Peninsula Partnership has recommended that Chichester District Council adopt *Towards ICZM* as an aspirational plan, and a material consideration for planning and Development Control purposes. The Plan will be kept under review and will be discussed with neighbouring coastal authorities. It is hoped the emerging Core Strategy will reflect the aims objectives of the ICZM.

Alongside the development of the ICZM approach, the Chichester Coastal Change Pathfinder Project also explored approaches to community engagement. This included developing development of a coastal literacy programme to produce web based learning, information materials and other tools to equip local people with the knowledge and understanding needed to participate in adaptation decision making. This accompanied wider work on engagement, including through community outreach work and development of a coordinated engagement and communications plan for all coastal related activities and initiatives. The concept of a community owned trust for the town of Selsey is being explored with a view to this coastal trust potentially overseeing a series of regeneration projects.

#### 4. Lessons Learnt

The following lessons were learnt as a result of the Chichester Coastal Change Pathfinder Project:

- A key lesson of the development of the ICZM was the importance of ensuring that the document is formally adopted by the Council, ensuring that it forms a material consideration in planning decisions and contributes towards the formation of planning policy.
- An **integrated** approach is essential to the delivery of Coastal Management and should be taken forward through national guidelines, integrating hinterland related issues into coastal management, i.e. looking at the bigger picture.
- Partnership working is a beneficial process working with stakeholders and the community on all aspects of development, coastal issues and infrastructure. This creates a 'joined up approach' which is all encompassing.

Overall, through the longer term work of the MPP it is felt that in many ways the community has recognised the risks and opportunities the area faces more comprehensively than the local authorities. By way of example, local people have, on the whole, accepted the scheme to create a managed coastal realignment at Medmerry, in

Bracklesham Bay. Although they recognise that the untested pilot scheme carries risks, they can also see that it may in turn offer benefits to the area's main economic provider – tourism. Residents are concerned that gradual environmental degradation in the Manhood and coastal erosion will eventually impact their tourism product, causing local shops and services to close. However, the managed realignment offers a huge opportunity for the area to reassert its position as a unique area of attraction to tourists.

A-12

At the same time residents recognise that the peninsula is a living and working environment. This is where ICZM is vital. Housing for local people and support for local businesses is essential. The Manhood Peninsula is at a critical juncture, with its economy, social well-being and environment at a tipping point. Water management pressures are severe and likely to worsen, land-use pressures are great and often contradictory, and for a long time infrastructure has failed to keep up with development.

## 5. Further Information

Further information about this case study is available from the following sources:

- Chichester Coastal Change Pathfinder Project (2011). *Towards ICZM on the Manhood Peninsula*. Manhood Peninsula Partnership. August 2011.
- Chichester Coastal Change Pathfinder Project website: *Integrated Coastal Zone Management*. Website address: <http://peninsulapartnership.org.uk/projects/coastal-change-pathfinder-project/integrated-coastal-zone-management-iczmm/>. Date accessed: 16/11/2012
- Department for Environment, Food and Rural Affairs (2012). *Coastal Pathfinder Review: Final Report*. January 2012.
- Department for Environment, Food and Rural Affairs (2011). *Coastal Pathfinder Evaluation: An Assessment of the Five Largest Pathfinder Projects*. November 2011.

A-13

# Case Study: North Norfolk District Council

## 1. Location

North Norfolk District Council is located on the east coast of England. The coastline is comprised of sand, gravel and clay cliffs that are vulnerable to coastal erosion and low-lying areas vulnerable to flooding. Some areas are protected by hard coastal defences.

There are many communities located along the coast, with many at the low end of social deprivation indices, although there are some pockets of greater wealth in some areas.

The coastline is also extensively designated for its environmental features, and particularly the geology of the coast. Designations currently include Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Site of Special Scientific Interest (SSSI). These may soon also include Marine Conservation Zones that are proposed for parts of the coast.

## 2. Coastal Change Issues

The Shoreline Management Plan review (SMP2) covering parts of the North Norfolk District Council coastline advocated changes to policy from continued defence to no active intervention, which would expose large areas of the coastal cliffs to increased rates of erosion and (in the longer term) increased risk of flooding in low-lying areas. This change in SMP policy poses increased risks in some areas to property, local communities, environmental assets and infrastructure. It also raised questions about how development would be managed in areas at risk.

The predictions of erosion generated from the SMP2 have resulted in blight for property owners with impacts on house prices. They have also reduced the ability of areas identified as being at risk to attract business investment.

## 3. Adaptation Measures Taken

Based upon evidence from the SMP2 and through stakeholder engagement activities, North Norfolk District Council identified Coastal Erosion Constraint Areas (Policy EN11) through their core strategy. The policy is designed to discourage development within these areas unless it can be demonstrated that it will result in no increased risk to life or any significant increased risk to property. A separate guidance note (*Development and Coastal Erosion*) was published to provide clarity about the implementation of Policy EN11 and guidance on the nature of development that is likely to be appropriate within the Coastal Erosion Constraint Area. In particular, this guidance states that temporary development may often be considered as an appropriate response to coastal change because it can help the community 'gain time' to enable adaptation. Changes in use (e.g. from residential to employment related) of existing buildings may also be another means of enabling adaptation as they can be time limited.

To enable adaptation in advance of the actual loss of property and to minimise the potential effects of blight, North Norfolk District Council also developed Policy EN12 to help facilitate 'roll back' of development in risk areas to 'safer' areas inland. This policy allows for residential properties at risk within 20 years, and businesses at risk within 50 years, to relocate to 'safe' areas outside of those defined in the local plan, subject to other planning guidance etc.

In support of the implementation of these policies, North Norfolk District Council provides site specific vulnerability reports for house purchases. These assessments are based upon a range of evidence including historical rates of erosion; existing coastal defences and their expected life; and SMP policies over the short, medium and long term.

A-14

The North Norfolk Coastal Change Pathfinder Project (completed in 2011) tested ways of aiding the implementation of the 'roll back' policy. In particular, this Pathfinder project looked at 'buy and lease' mechanisms. It also looked at relocation approaches for both residential property and businesses (e.g. caravan park).

## 4. Lessons Learnt

The North Norfolk Coastal Change Pathfinder Project found that the **'buy and lease' mechanism tested was possible to deliver, but not attractive to do so at the time due to the high level of risk involved**. In part these risks are associated with legal issues (some of which may be possible to overcome following introduction of the Localism Act 2012, though this needs to be investigated). It also concluded that the term 'buy and lease back' is a somewhat of a misnomer as once bought the property could be leased to anyone, not just leased back to the

current occupier/previous owner.

The approaches tested as part of the Pathfinder project with regards relocation of both residential property and businesses found that a key issue is that **whilst there may be a policy in place to enable relocation, there is difficulty in finding appropriate/suitable available land** (with a community willing to accept relocated assets) to facilitate relocation in practice.

**Working with local community is essential and responsible authorities must be prepared to put the necessary resources into this.** Relationships developed through the Pathfinder project were one of the most important outcomes. For the Pathfinder project this was aided by use of the local Coastal Concern Action Group without whom the level of engagement achieved may not have been possible.

## 5. Further Information

Further information about this case study is available from the following sources:

- Department for Communities and Local Government (2010). *Planning Policy Statement 25 Supplement: Development and Coastal Change Practice Guide*. March 2010.
- Department for Environment, Food and Rural Affairs (2012). *Coastal Pathfinder Review: Final Report*. January 2012.
- Department for Environment, Food and Rural Affairs (2011). *Coastal Pathfinder Evaluation: An Assessment of the Five Largest Pathfinder Projects*. November 2011.
- North Norfolk District Council (2008). *North Norfolk Core Strategy*.
- North Norfolk District Council (2009). *Development and Coastal Erosion Guidance*. April 2009.

A-15

## Case Study: Reculver Masterplan

### 1. Location

Reculver is an historic settlement situated on the North Kent Coast, between Herne Bay and Margate. It has a rich history stemming from Roman times with human activity closely tied to the moving coastline, Christianity and, more recently, leisure. The settlement is bounded by Reculver Country Park to the west (with numerous regional, national and international designations) and predominantly farmland to the south and east. A Roman fort and ruined Saxon Church form a Scheduled Ancient Monument that is highly regarded as a key landmark in the area.

### 2. Coastal Change Issues

Reculver has reached a key point in its history as it has been highlighted as a potential strategic hub for a wider regional tourism and leisure strategy, especially for so-called 'green tourism'. There are several projects improving cycle links connecting the Viking Coastal Trail to National Cycle Route 1 at Seasalter. The existing country park visitor centre has been allocated monies for a much needed extension to continue its development of educational work and highlight sustainability. The existing businesses - caravan parks, cafe, shop and public house are having to adjust to a shift in the profile of the visitor that comes to Reculver and are considering how to invest and develop for the future.

There are a significant number of international, national and local designations and policies that apply to the country park and its surrounding area. These generally serve to protect the positive characteristics of the area but they can be confusing and are frequently considered by the public to be very restrictive, especially on access, development and business investment.

Alongside all of the above, the coastal policy relating to flooding and sea defence as defined in the Isle of Grain to South Foreland Shoreline Management Plan Review (SMP2) is for managed realignment to occur in the future. This raises key questions of the future usage of areas to the east (West Wantsum) as well as ongoing erosion to the cliffs in the country park in the face of this expected future coastal change.

### 3. Adaptation Measures Taken

In order to analyse and address the various issues, as well as seeking to optimise the understanding and usage of the existing natural and historic assets, in 2007 Canterbury City Council began development of a masterplan for the future of the country park.

The aim of this masterplan is to provide a co-ordinated vision for the enhancement of Reculver. It sets out principles for development in line with existing policies, aspirations of the existing stakeholders and existing and future funding streams. It is complimentary to projects already in existence and provides a framework for future changes to the physical environment as well as for improving the perception and management of the area.

As there are various stakeholders (public and private) and numerous potential funding streams the masterplan is not overly prescriptive. However, it gives clear design and management guidance on the various physical projects and will be adopted as a 'material consideration' by the local planning authority in determining new applications.

The overall objective for the masterplan is "*To develop Reculver as a high quality strategic hub for green tourism and education*". This is underpinned by a series of key principles, as follows:

- Provide high quality sustainable facilities, improving the experience for visitors and local residents
- Improve wayfinding and access

A-16

- Optimise existing assets and strengths associated with designations and policies relating to Reculver
- Co-ordinate management of the area bringing together public and private interests
- Establish clear linkages to the surrounding area and the wider regional context
- Change negative perceptions and raise the profile of Reculver.

With particular regard to coastal change issues, Section 3.8 of the masterplan (volume 1) sets out how the SMP policy has influenced the masterplan, including:

- Local Plan policies seek to create new, or improve existing, wetland wildlife habitats where these compliment flood risk reduction measures. There are potential long term benefits for the country park in green-tourism, the local economy and wildlife if significant wetlands were created as part of a managed retreat policy in West Wantsum.
- A future review will be carried out by the Environment Agency on managed realignment within West Wantsum and possible secondary defences, as there is no detail available at present. However, in principle the masterplan could promote the creation of a wetland which would also be considered beneficial by the Environment Agency subject to necessary flood implications upstream and consultation with the Internal Drainage Board and landowners.
- The flood risk assessment for Reculver will assist local businesses to make informed decisions and provides a level of surety for the masterplan proposals for further development within the caravan park frontages and public land to extend the tourism accommodation offer.

The implementation of the masterplan has been structured as a series of different projects. Some of these projects are inter-linked with others while some are 'stand-alone'. The advantage of this approach is flexibility of implementation when funding becomes available. Therefore, to underpin this, a flexible strategy relating to programme and budget must also be established particularly as private investment will be required for some aspects of the masterplan.

In support of this approach, there are two particularly key projects to be completed at the start of the masterplan implementation. The first is the establishment of a Public-Private Partnership Group to deliver a co-ordinated stakeholder approach to the development of Reculver. The second is the appointment of a 'Reculver Co-ordinator' with the objective of driving the delivery of the masterplan projects and co-ordinating the interests of all stakeholders. Their priority would be to develop the country park as a quality destination for green tourism, including the development of high quality and sustainable accommodation provision.

### 4. Lessons Learnt

This case study provides an example of how long term planning for an areas development can incorporate coastal change.

## 5. Further Information

Further information about this case study is available from the following sources:

- Allan Scott Ltd (2008). *Reculver Masterplan Report: Volume 1*. Canterbury City Council. December 2008.
- Allan Scott Ltd (2008). *Reculver Masterplan Project Plans: Volume 2*. Canterbury City Council. December 2008.

A-17

# Case Study: South Milton Sands, Devon

## 1. Location

South Milton Sands is a heavily used 2ha sand dune site with a small beach and extensive car parking. The area is within an Area of Outstanding Natural Beauty and County Wildlife Site which is a popular site with families for beach activities and swimming and so attracts a high number of visitors each year.

## 2. Coastal Change Issues

The wooden piling defences constructed in 1990 were at the end of their lifespan and thought unsustainable considering the erosion at the site.

In addition, the car park had developed organically to cope with the numbers of people visiting and now encroached on to the sands.

The community, natural habitats and built structures will also be affected by coastal change.

## 3. Adaptation Measures Taken

The National Trust appointed consultants to consider possible options with local stakeholders, neighbours and owners and to design a scheme which allowed the dunes to erode and build according to natural processes. Extensive consultation techniques were employed to ensure good relations continued. The contractors who removed the defences and re-profiled the dunes were also briefed to respond to enquiries. Once ground work was completed, local people helped plant the marram grass on the dunes. The whole process took approximately six years.

The table below summarises the main issues at South Milton, the solution arrived at and the outcome.

Issue	Mitigation proposed	Outcome
<b>Parking</b> Community was concerned that car parking and beach access may be lost to some extent	Small parking area was retained on the site with good views out to sea. Additional parking arranged on adjacent private land at peak times. Access to the beach was improved with board walks.	People thought these were reasonable proposals and accepted them
<b>Access</b> Many people were concerned that the track (slipway) may 'blow-out'	National Trust agreed to maintain and protect the track, within reason, for the next 10 years. After this time any incident will have to be assessed.	This proposal seemed to find acceptance with local people and gave them time to adapt
<b>Nature conservation</b> Devon Bird Group worried about impact on adjacent nature reserve. It must not be assumed that this type of group will be supportive even though the habitat is being improved for wildlife	More information and engagement with the group was organised	The group was reassured and each issue was dealt with to their satisfaction

<b>Archaeology</b> This was not a well known archaeological site but with all the earth movements there was some possibility of disturbance	A pre-work survey was conducted and an archaeologist conducted a watching brief on some of the days that contractors were on site	This was thought to be a reasonable compromise to a site that may or may not have archaeological remains
<b>Neighbouring apartment buildings</b> Residents concerned that the removal of sea defences might impact on the apartment building	Agreed that a small amount of rock armour would be put in place at the base of the apartment building adjacent to the slipway	Apartment residents have stayed supportive and even helped with the planting of marram once the groundwork was complete

The property is now subject to 'natural processes' and National Trust will monitor and review how the dune system develops in the future. If necessary National Trust may have to consider further works in consultation with local people if the property has been subject to a large storm event which may have compromised the access to the property, or adjacent neighbouring property.

#### 4. Lessons Learnt

The National Trust reported their experience from this project in the following way:

• **What went well and we'd do again:**

- Listening and learning from others, keeping an open dialogue between all parties
- Allowing time for lengthy consultation and any meaningful studies/investigations that may be necessary. In this case it took six years to prepare people for the dramatic scale of on-site works (the physical works were completed in around four months).
- Employing an independent 'honest broker' to take neutral stance during the engagement/consultation process. The South Hams AONB service acted as chair at public meetings which allowed Trust staff to participate so a full discussion happened. Property staff placed a significant emphasis on local community engagement as a fundamental part of the project. The independent Plymouth University Marine Section also provided impartial advice on what they saw happening in the future.
- Employing a broad spectrum of communications to reach different audiences and surveying the views of local people. Informal exhibitions were used so that people could see the proposals and question staff on them. Formal meetings were not held until proposals had been agreed and people were already re-assured and supportive.
- Organising community events as part of the implementation. Two marram grass planting days were very well supported with unanimous and extremely positive feedback giving a sense of celebration and ownership to local people who took part. It also generated a lot of positive publicity.
- Keeping in close liaison with South Hams planning officers for planning permission approval.
- Having good contractors whose site staff were well briefed and able to answer questions from the public, reassuring them before anything escalated to an issue that needed to be resolved.

• **What could have been done better and we'd do differently next time:**

- Make sure all relevant stakeholders are involved
- Assess whether consultative methods adequately cover visitors as well as local residents and interests
- Be realistic and dedicate adequate staff time to the project to keep momentum and avoid delays.

A-19

- Nobody expected this project to take as long as it did but people need time to understand and come to terms with change. The lesson here is not to rush this stage when major change is proposed for a well-used site and to set realistic timescales for change projects.
- We were surprised that nature conservation parties were particularly difficult to win over; the expectation was that they would understand and 'get' what we wanted to do quickly and easily – this

was not the case. A number of conservation organisations had strong preservation leanings. More time was spent putting across National Trust views and winning them over, eventually.

• **Positive outcomes:**

- Some stakeholder perceptions of the National Trust changed for the better due to the process – National Trust relationship/reputation locally is now excellent.
- Support by key local influential respected people, e.g. the Managing Director of Heligan Gardens, some of the local farmers and the chairman/leader of the local apartment block owners association was also crucial to the project.
- There has been positive feedback that the project has worked well, with only a little bit of negative feedback about the loss of car parking spaces at peak times.

## 5. Further Information

Further information about this case study is available from the following sources:

- Ford, D., Dyke, P. & Woodhall, A. Adrian (2009). *Summary of case study on South Milton Sands, Devon: Removing sea defences and allowing natural processes*. National Trust. November 2009.
- South Milton Sands: David Ford, General Manager, [david.ford@nationaltrust.org.uk](mailto:david.ford@nationaltrust.org.uk)
- Other coastal matters: Phil Dyke, Coast & Marine Adviser, [phil.dyke@nationaltrust.org.uk](mailto:phil.dyke@nationaltrust.org.uk)

A-20

## Case Study: Steart Coastal Management Project

### 1. Location

The Steart Peninsula is a low-lying area of land located on the western side of the mouth of the Parrett Estuary in Somerset. It lies on the southern side of Bridgwater Bay and discharges into the wider Severn Estuary/Bristol Channel. It is bounded on its eastern side by the channel of the River Parrett and on its northern side by extensive areas of inter-tidal mudflat and salt marsh.

The area is designated for its environmental features as part of the Severn Estuary Special Area of Conservation.

### 2. Coastal Change Issues

The Steart Peninsula lies within the Severn Estuary which is designated as a Natura 2000 site, and Shoreline Management Plans and Strategies are damaging this just by holding the line of existing defences, due to coastal squeeze. The Environment Agency has a legal obligation to create habitat to compensate for the losses caused by the wider Severn Estuary strategy for flood risk management. The managed realignment at Steart is an opportunity to provide compensation for a significant portion of predicted habitat losses.

### 3. Adaptation Measures Taken

The Steart Coastal Management Project began in 2008 with an initial feasibility study that had the following objectives:

- Identify the opportunities relating to intertidal habitat creation at Steart.
- Identify the options for intertidal habitat creation and associated flood risk management.
- Provide an appraisal of feasibility and cost of the options.

In order to achieve these objectives, which subsequently resulted in the progression to detailed design and now construction, this project has involved extensive consultation at all stages with both the local community and statutory consultees in order to ensure that the needs of the community and any potential impacts upon the community and the environment have been taken into account. This consultation was, in part, also facilitated by the Somerset Coastal Change Pathfinder Project that occurred during the development of this project.

The development of the scheme has also involved extensive numerical hydrodynamic modelling of the coastal and estuarine processes at the site and in the wider area of the Severn Estuary/Bristol Channel. Calibration against the Environment Agency's modelling standards was achieved to ensure the quality of the outputs delivered was robust.

The numerical modelling was used by expert coastal geomorphologists to assess the potential implications of realignment upon the physical processes in the area. This included assessment of any potential for changes in the position of the Parrett Estuary low-water channel and any associated impacts upon the beaches and coastal defences at Burnham on Sea located adjacent to the site on the opposite side of the low-water channel. This expert assessment helped to inform a detailed Environmental Impact Assessment, Habitat Regulations Assessment and Water Framework Directive Assessment that was completed as part of the project. The results of these assessments then guided the development of a detailed monitoring programme to be carried out over the next five years to allow robust appraisal of the actual impacts of the scheme to be regularly reviewed and assessed.

The a complex scheme recently passed through planning approvals first time without objections and construction of works to create new areas of intertidal habitat will commence in 2012/13. The scheme that is being implemented will deliver the following outcomes and achievements:

- Creation of a variety of new inter-tidal habitat.

A-21

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## Page 85

- Flood defence benefits to the local communities.
- Good visitor management to maintain the peace and tranquillity of the area.
- Better access to the area through new rights of way.
- Potential for community involvement.

### 4. Lessons Learnt

The a complex scheme recently passed through planning approvals first time without objections due to the extensive engagement activities that were undertaken throughout the development of the project from its inception in 2008.

In addition to extensive stakeholder engagement in order to support the development of a managed realignment scheme from inception to detailed design to planning application to construction, a wide variety of assessments and studies are required. These include:

- Options assessment/appraisal leading to detailed design.
- Ecological surveys.
- Environmental Impact Assessment.
- Habitats Regulations Assessment.
- Water Framework Directive Assessment.
- Ground investigation.
- Data collection and modelling of coastal/estuarine processes.
- Geomorphological assessment.

### 5. Further Information

Further information about this case study is available from the following sources:

- Environment Agency (2011). *Steart Coastal Management Project Environmental Statement: Non-Technical Summary*. December 2011.
- Environment Agency website: *UK's largest new wetland to be created in Somerset*. Website address:

- Somerset Coastal Change Pathfinder website: *Stearth*. Website address:

## Case Study: West Dorset, Weymouth & Portland Coastal Risk Planning Guide

### 1. Location

The area covered by the West Dorset, Weymouth & Portland Coastal Risk Planning Guide extends from the chalk headland of White Nothe at the eastern boundary of West Dorset District Council with Purbeck District Council, to Lyme Regis undercliff at the western boundary of West Dorset District Council with East Devon District Council.

The coastal zone in between is highly diverse and of global significance for its geological and geomorphological features, as recognised by much of this area lying within England's only natural UNESCO World Heritage Site – the 'Jurassic Coast'. The area also has many other environmental designations including SAC, SPA, Ramsar, SSSI and AONB.

The natural features of the coast include clay-rich cliffs that experience infrequent, large-scale landsliding events driven by combination of wave erosion at the base of the cliffs and groundwater. Examples include Black Ven at Charmouth, the undercliff at Lyme Regis and West Cliff at West Bay. There are also more erosion resistant cliffs comprised of limestone and sandstone such as those at Portland and Burton Bradstock respectively. Between the Isle of Portland and West Bay is the world famous Chesil Beach – a large shingle barrier beach that encloses The Fleet saline lagoon.

Much of the coast is undefended, allowing natural processes to occur unhindered. However, there are also a number of settlements along parts of the coast ranging in size from small, isolated villages such as Ringstead, Seatown and West Bexington, to large towns such as Weymouth, Portland, West Bay, Charmouth and Lyme Regis. Many of these settlements are defended by hard defences including seawalls and slope stabilisation measures. They also provide areas of both permanent employment, and seasonal employment to serve the large tourism sector that the areas economy is heavily reliant on.

### 2. Coastal Change Issues

There are many coastal change issues facing this coastline in the future, but key ones are:

- Along the undefended cliff areas there is potential for large amounts of cliff top recession which, in some cases, could impact upon significant areas of existing development. Some areas of smaller settlements also face the possibility of changes in SMP policy from current policies of hold the line to either managed realignment or no active intervention in the medium to longer term. In each of these areas measures to adapt existing development and control any future development are needed.
- A number of key transport routes are also threatened by future coastal change in the longer term. There are limited options to provide alternative routes and so short term planning decisions need to be mindful of the future transportation infrastructure requirements that may be 50 or more years in the future.
- In addition, many of the larger settlements will need to face up to the dual challenges of sea level rise in terms of increased risk of coastal flooding (unless seawalls are made much higher than present structures) and reduction in the size of beach due to coastal squeeze which would be expected to have an adverse impact upon the local and regional economy which is heavily dependent upon tourism.

### 3. Adaptation Measures Taken

- provides consistent advice on planning application requirements along the West Dorset, Weymouth and Portland coast;
- provides the basis for consistent planning application decisions along the West Dorset, Weymouth and Portland coast; and
- will inform the future development of Coastal Change Management Areas (CCMAs) along the West Dorset, Weymouth and Portland coast.

The guidance identifies the nature of the coastal change risks to each section of coast within the West Dorset District Council and Weymouth & Portland Borough Council areas. In doing so, 'risk' is defined as the adverse impact and consequences of a hazard, which may be coastal erosion, landsliding or flooding. 'Coastal risk zones' are therefore areas of projected adverse impact and consequences where particular consideration should be given during the planning process.

The risks are identified for 33 separate sections of coast. For each section the following information is provided:

- A map showing the coastal risk zones within the section, be it from erosion, landsliding, flooding or a managed realignment policy.
- A description of the section of coast.
- A summary of the relevant Shoreline Management Plan (SMP) policy.
- A description of the nature of the coastal change risks including the nature of the hazards and timing and frequency of the risk occurring; based upon a desk-study review and expert assessment of all available data. This is based primarily on information contained in the SMP2, National Coastal Erosion Risk Mapping and recent studies completed post-SM2P. In addition, expert assessment of complex cliff and managed realignment areas has been completed as part of the development of the guidance using available data.
- The assets likely to be affected by future coastal change. This is based on areas of existing development and areas of planned development, as set out in the Draft Local Plan.
- Recommendations for development management, giving due regard to current guidance such as the National Planning Policy Framework; the results of the Jurassic Coast Coastal Change Pathfinder project; and other published guidance. This includes:
  - development restrictions setting out where different types of appropriate development should or should not occur based on the risk zones
  - the evidence required to support planning applications for different types of development within different risk zones
  - future planning policy recommendations.

The concluding section of the guidance provides recommendations for future updates of this document, including further studies to improve the predictions of coastal change risks given the current uncertainties identified in the guidance.

#### 4. Lessons Learnt

The development of the coastal risk planning guidance took a staged approach. The first stage involved reviewing the SMP2 policies and supporting information to the SMP2 to identify the nature of the coastal change risks for each section of coast. Having identified the nature of the risks, the second stage was to map the hazards. From this it is then possible to identify areas of current or future planned development that are at risk from the coastal change hazard(s) in each area, as well as determine what types of development should or should not occur in each area of risk depending on the nature of the coastal change hazard posed.

This staged approach was found to provide a robust and auditable approach to developing the coastal risk planning guidance.

## 5. Further Information

Further information about this case study is available from the following sources:

- Halerow (2013). *Managing Coastal Change: Coastal Risk Planning Guidance for West Dorset, Weymouth & Portland*. West Dorset District Council and Weymouth & Portland Borough Council. March 2013.

A-26

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