

# Natural England Board



Meeting: 13

Date: 5 November 2008

Paper No: **NEB PU13 04**

Title: **Natural England's Draft Policy on Coastal Change**

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## **1. Purpose**

- 1.1. This paper presents Natural England's draft policy on coastal change. The need for a draft policy on coastal change was identified in the *Coastal Policy Review* in 2007.
- 1.2. Annex 1 sets out the proposed draft policy.
- 1.3. An informal consultation of key stakeholders is currently underway. Feedback received will be reported to the Board at the meeting.

## **2. Recommendation**

- 2.1. It is recommended that the Board considers and agrees the draft Coastal Change Policy prior to external consultation and sign off by Chair.

## **3. Summary of Context of our Coastal Change Policy**

- 3.1. Coastal change is inevitable: even without sea level rise the coastline changes because of the action of coastal processes. It continually receives incoming wave, wind and tidal energy and responds through the combined processes of erosion and accretion.
- 3.2. Sea level rise, as a result of climate change and the land slowly sinking in south-east England since the end of the last Ice Age, adds a further complicating dimension because it is accompanied by increased levels of wave and tidal energy. The normal response of an unmanaged 'soft' coast to sea level rise is landward movement of the shoreline, with shallow seas covering more of the coastal plain. This response creates both management challenges and opportunities for the natural environment, businesses and communities at the coast.
- 3.3. Natural England is actively involved in the management of coastal change. We are a statutory consultee and adviser in relation to most flood and erosion risk management schemes undertaken by the Environment Agency and local authorities; we are responsible for designation and management of coastal wildlife and landscape assets; we are responsible for developing Government's approach to coastal access; we directly manage several coastal National Nature Reserves, are responsible for agri-environment

schemes at the coast and we engage in the development of strategies that determine the long term management of the coast.

- 3.4. People have been trying to prevent coastal erosion and to stop flooding for many years. Modern centrally funded defences mean that people have ceased to understand the link between the cost of defences and the benefits they provide. Coastal communities have often come to regard coastal defence as a right and to be technically feasible everywhere. In addition there is often an assumption that those responsible for flood and coastal erosion risk management are in charge of all coastal management activity. This is not the case: there is currently an absence of joined-up management and funding solutions for the wider coastline.
- 3.5. Effective solutions to the sustainable management of changing coastlines generally rely on the management of coastal sediment (mud, sand and gravels). One of the key challenges for coastal managers is the decline in the availability of coastal sediment as a result of past human interventions and because much of the sand and shingle sediment supply to England's coast was originally glacial material pushed on shore as sea-levels rose; this source is now effectively exhausted. New, innovative, management approaches such as 'sediment husbandry' (looking after the remaining sediment already in the system) and 'geomorphological engineering' (physical manipulation of coastal systems to harness the power of coastal processes to the benefit of society) are needed; these would work with coastal processes to create a dynamic coastline resilient to future changes.
- 3.6. Nearly a third of our most important protected areas for wildlife occur in the coastal zone (sites with an international designation). A high proportion is inter-tidal, but coastal grazing marsh and coastal wetlands are also significant. Almost 20% of all SSSIs with geological features are at the coast. Over half of all Areas of Outstanding Natural Beauty have a coastal element; 6 out of 9 current or proposed national parks in England have a coastline. One of the greatest challenges for the current Natural England led coastal access initiative is developing effective mechanisms to allow realignment of access routes as the coast evolves.
- 3.7. Coastal change has implications for protected areas at the coast. As the coast evolves, and in particular as it erodes, it is possible for the features of interest (eg geological exposures) to migrate landwards and so end up outside the boundary of the protected area. This deprives the natural environment interest of legal protection and makes it vulnerable to damaging development proposals.
- 3.8. The coast is also important to those who live and work there and as a recreational resource. The management response to coastal change is a key issue of concern for local communities and effective solutions need to secure the understanding and ownership of all those involved.

#### **4. Summary of Natural England's Draft Policy on Coastal Management**

Natural England believes that:

- management of the English coastline should focus upon the development of a dynamic environment resilient to the action of coastal processes and sea level rise.

- there is a need to conserve, manage and sustain sediment supplies that feed coastal systems and the landscapes and habitats they support.
- the challenge of coastal change and rising sea levels requires new adaptation mechanisms to deliver sustainable coastal management.
- all of Natural England's policies (including protected site designation policy) should fully take in to account the implications of coastal change and rising sea-levels and that these issues need to be addressed in the development and delivery of action for the natural environment and in the advice we offer to others.
- planning for critical coastal infrastructure and access routes must take account of dynamic responses to the action of coastal processes and sea level rise.
- there is a need to facilitate the migration and adaptation of key natural environment interests as the coast evolves, by appropriate use of regulation, advice and incentives.

## **Annex 1**

### **Coastal Change Draft Policy**

This paper sets out a draft policy on coastal change for Natural England. It summarises how coastlines change, explains the implications of these changes for the natural environment and sets out Natural England's views on how we should address the coastal change challenge.

#### **Context**

As an island nation the coast has a special place in the national consciousness. England's coast is also unusual in having an extremely diverse geology, shaped by glacial, fluvial and coastal processes to create a wide variety of landforms. These landforms underpin both coastal landscapes, the wealth of wildlife found around our shores and a host of recreational opportunities. Coastal processes that shape these areas are ongoing and we need to understand how to take account of this as we manage the natural environment and our use of it.

Coastal change is inevitable: even without sea level rise the coastline changes because it is continually shaped by wind, wave and tidal energy and responds through the combined processes of erosion and accretion. In so doing cliffs erode, beaches build and sand, gravel and fine sediments are moved along the coast. Sea level rise itself has secondary effects as it increases wave and tidal energy.

Coastal management is important to Natural England in a variety of ways. We are statutory consultees in relation to flood and erosion risk management undertaken by the Environment Agency and Local Authorities; we are responsible for designation and management of protected areas for wildlife and landscape; the management of coastal National Nature Reserves, agri-environment schemes at the coast (including special options for coastal habitats), we are responsible for developing Government's approach to coastal access; and we engage in the development of long-term flood and erosion risk management strategies.

Most parts of the coast offer a unique and valued experience for local people as well as for visitors, and are a key link to the marine environment. The coast is a major draw for recreational visits with more than 70 million visits to the English coast and 45% of the English public visiting a coastal town or village each year. Furthermore, a significant proportion of the coastline of England has been designated as an Area of Outstanding Natural Beauty (AONB) or as a National Park on account of the high quality of their landscape and seascape.

Nearly a third of the internationally important wildlife sites in England lie in the coastal zone. A high proportion of these are inter-tidal, but there also coastal grazing marshes, coastal wetlands, shingle beaches, sand dunes and soft cliff habitats. There are also nationally important sites of geological and geomorphological interest. As sea levels rise, inter-tidal habitat must respond if it is to avoid being lost. It is wholly dependent upon a combination of sufficient new sediment to feed vertical accretion (the build up of mudflats and saltmarshes) and sufficient space to allow landward movement. Geological features on the coast are reliant upon coastal erosion to maintain their exposures for appreciation and study.

## Issues

Our entire coast is changing. In some areas these changes are slow and have relatively few implications for management decisions; in other areas changes are rapid and have a profound influence on both the natural environment and the way we use and manage the coast. By way of example the 60km of the Holderness coast in East Yorkshire has a documented history of erosion stretching back hundreds of years; the southern parts of this coast are still eroding at more than 2 metres per year.

Some of the key issues are set out below:

- Sea level rise and coastal change is inevitable – this creates both opportunities and challenges. Sustainable coastal management needs to embrace change;
- Coastal conservation is essentially about management of the physical system rather than specifically about management of individual habitats or species;
- Sediment availability is declining leading to the ‘starvation’ of coastal systems and increasing the rate of coastal change;
- Remaining sediment supplies need to be safeguarded so that the coast is naturally more resilient to change;
- Rapid coastal change is most widespread on the south and east coasts, but examples of the same issues occur throughout the country;
- Coastal infrastructure such as railway lines, roads and bridges may require realignment into areas of wildlife or landscape importance as the coast changes;
- Nationally there is a shortfall in the availability of skilled staff with an in depth understanding of coastal process, coastal change and suitable management responses;
- New coastal management and funding mechanisms are required to enable adaptation;
- As the coast changes so the mosaic of habitats and species as well as the landscape and its ‘local distinctiveness’ will change and evolve. We need to manage these changes to ensure the best outcomes for the natural environment.

## Policies

**1. We believe that management of the English coastline should focus upon the development of a dynamic environment resilient to the action of coastal processes and sea level rise.**

Achieving a sustainable response to coastal change involves reaching common agreement on what a resilient coast should look like, both for communities and for the natural environment. Central to this approach is the need for ‘sediment

husbandry'. Sediment is the foundation-stone for coastal evolution and management, but the amount of available sediment at the coast is in decline. Coastal resilience requires managing coastal processes, the available sediment and the way we use the coast to allow the coast to respond without creating ever increasing demands for new, and expensive, management measures. This might mean that we need to allow erosion of some currently defended cliff systems.

Building new defences is expensive, can damage the natural environment, and can cause unforeseen impacts elsewhere in the coastal system. The development of shoreline management plans (SMPs) in the 1990's went some way to create a strategic approach, but these are centred on dealing with flood and coastal erosion risk. We now need to adopt more holistic goals for management of the coast and a more radical approach that looks to the management of whole physical process units and delivers on wider management opportunities. Such solutions would work with coastal processes, using limited strategic interventions to create a coast resilient to reduced sediment supplies and rising sea levels.

As a consequence of these changes the mosaic of habitats and species, landscape features and recreational opportunities are all continuously evolving. There is a need to embrace these changes in the way we both conserve and use the natural environment and to accept that this may on occasion mean the loss of once valued environmental assets. However, what replaces these assets will in turn have a value of its own, and there will be need to manage the process of change so as to maximise the opportunities that arise as the coast evolves.

### Evidence

The coast has not stopped evolving, even though our coastal defences have been strengthened. A recently published study showed that foreshores were steepening in over 60% of cases. This process of steepening will ultimately lead to defence failures with engineering solutions becoming increasingly expensive.

Coastal habitats are not only important for wildlife, they are a key part of our flood defences. Estimates of their value per metre of defence vary, but a good rule of thumb is that costs of defence rise exponentially as saltmarsh recedes. In 1998 the Environment Agency estimated that the difference in costs, for building new seawalls, with 30 metres of saltmarsh in front of the seawall and no saltmarsh was £800 per metre as opposed to £5,000 per metre.

A potentially more sustainable approach to the management of the coastline, especially in rural areas, is through limited physical interventions that enable a more sustainable coast to evolve and respond to in a way that is resilient to further change. This has been described as 'geomorphological engineering'. Examples include several recent managed realignment schemes, most notably Alkborough on The Humber where the scheme is designed with a spillway that 'catches' storm surges so reducing flood risk and delaying by decades the need to raise existing seawalls. On the open coast such innovative interventions are still largely theoretical however they have the potential to work in harmony with natural environment management objectives. In delivering a robust but evolving coastline, this approach is likely to lead to changes in the natural environment as both landscapes and their wildlife would also need to change.

## **2. We believe that there is a need to conserve, manage and sustain sediment supplies that feed coastal systems and the landscapes and habitats they support.**

Shortfalls in sediment supply are rapidly developing to be a key issue. These problems are exacerbated because much of the sediment on our coastline comes from re-worked glacial material and in many cases that has now been exhausted. For example, supplies of shingle feeding the Orfordness foreland in Suffolk are largely exhausted, and supplies feeding Dungeness have been significantly depleted.

The use of coastal protection arising from public concerns about loss of property on cliff tops mean that remaining sources of sediment are still being constrained and removed. There is no commonly agreed way to value sediment still to be eroded and the contribution it makes to a robust coast elsewhere in the system. For example, fine sediment from the eroding coasts of Holderness, North Norfolk and Suffolk contributes significantly to near-shore suspended sediment levels that feed our estuaries – notably the Humber, the Wash and the estuaries of Essex, north Kent and Suffolk. This sediment is also important to other southern north-sea nations as it circulates towards a sink in the Waddenzee coast of Holland and north-west Germany.

Large scale beach recharge with sand or shingle is one way of feeding coastal systems with additional sediment. Generally this needs to come from off-shore sources although these are also exploited as a source of aggregate by the construction industry. Careful assessment of all applications for marine aggregate extraction ensures that any permissions do not themselves lead to an increase in erosion or flood risk. There is arguably a need to allocate strategic reserves of off-shore sediment to provide a current and future resource for beach 'recharge' schemes in vulnerable areas.

### Evidence

Work to develop Coastal Habitat Management Plans (CHaMPS) provided evidence of sediment shortfalls. This shortfall in sediment supply may well mean that coastal systems undergo sudden rapid changes rather than simple gradual evolution.

In the absence of sufficient sediment, foreshores are more vulnerable to erosion. Where sediment starvation occurs, coastal landforms tend to go into an erosional phase that feeds demand elsewhere. For example sediment eroded from foreshores in the outer part of an estuary will travel upstream and is deposited in the inner estuary. A further example occurs at Dungeness in Kent, where, with a decline in the natural shingle supply is eroding on its southern shore and accreting on its east coast.

## **3. We believe that the challenge of coastal change and rising sea levels requires new adaptation mechanisms to deliver sustainable coastal management.**

The existing duties of operating authorities to deliver flood and coastal erosion risk management for property and other built assets are permissive (there is no binding requirement to reduce these risks). This is well understood in relation to areas at risk of flooding, as is the possibility that there will be a flood event that exceeds the design standard of the defence. Decisions to abandon coast protection works (that

prevent erosion) have major implications for coastal communities because they are likely to lead to the total loss of property as the coast erodes.

While the numbers of properties likely to be lost to coastal erosion in the next 20 years is limited (probably less than 200) in the longer term this will increase. In such situations successful delivery of a sustainable coastline and effective management of the natural environment require new funding and other mechanisms that enable community and infrastructure adaptation as a result of a decision to withdraw funding from existing erosion defences.

Coastal erosion as well as creating a risk to property and other built assets also causes the loss of agricultural land. This has been suggested as a basis for new coast protection measures however the arguments set out in the 1911 report of the Royal Commission on Coast Erosion, both that the value of the land protected does not match the cost of building and maintaining coastal defences and that such an approach would also pass on erosion problems to other parts of the coastline still hold good today.

### Evidence

The difficulty of adopting a more sustainable approach to management of the coast has presented some serious challenges for Natural England and its predecessors. One of these challenges has been the lack of funding for adaptation rather than hard defences even where such a solution is cost effective and sustainable.

The need to develop a wider suite of approaches to management of the coast has already been recognised by Government in its 2005 *Making Space for Water Strategy*<sup>1</sup>. The Government is committed to producing an 'adaptation toolkit' and proposals for new adaptation mechanisms are expected in spring 2009.

**4. We believe that all of Natural England's policies (including protected site designation policy) should fully take in to account the implications of coastal change and rising sea-levels and that these issues need to be addressed in the development and delivery of action for the natural environment and in the advice we offer to others.**

Our coasts are changing, Natural England needs to reflect this across the full breadth of our own policies, in the work we undertake at or near the coast and in the advice we offer to others on coastal natural environment issues. Examples include: the coastal access initiative, selection of boundaries for protected areas, development proposals that impact on the natural environment at or close to the coast and choosing sustainable locations for new habitat creation schemes.

Coastal geological features are frequently designated as SSSIs because coastal erosion creates an exposure of rock strata otherwise unavailable inland. At such sites erosion is fundamental to maintaining exposures (and a rare opportunity to appreciate and study these features), these can easily be lost if obscured by coastal defences. As the coast evolves, and in particular as it erodes, it is possible for the features of interest to migrate landwards and so end up outside the boundary of the protected area. This deprives the conservation interest of legal protection, making it vulnerable to damaging development proposals.

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<sup>1</sup> Defra 2005. *Making Space for Water: taking forward a new government strategy for flood and coastal erosion risk management in England.*

Across the full remit of our work it makes sense to 'design in' the implications of a changing coastline so that we can seek appropriate solutions and new opportunities from the outset and help plan for any necessary adaptive measures.

In recent years coastal change has been taken in to account in selecting SSSI boundaries; however we are still left with an inherited legacy of sites where this issue was not fully considered.

### Evidence

The Natural England led coastal access initiative has embraced the need to examine coastal change from the outset; indeed this is written in to its high level objectives. This has enabled the implementation measures to be designed to include solutions to address change as the coast erodes, accretes or is subject to managed realignment. By contrast it has become apparent that the boundaries for some protected areas no longer offer full protection to the features of interest and this has created complications when we have to respond to potentially damaging development proposals.

A current review of SSSIs has already identified more than 30 sites where coastal change has left the features of interest either partly or completely lacking protection.

## **5. We believe that planning for critical coastal infrastructure and access routes must take account of dynamic responses to the action of coastal processes and sea level rise.**

Only a small proportion of industry and other infrastructure needs a coastal location. As the impact of coastal change and sea level rise becomes more acute there will be an increasing need to ensure new development can demonstrate an essential need for a coastal location, and can be built to take account of coastal processes and sea level rise. Where infrastructure reaches the end of its design life and re-development occurs, there is a need to determine whether the location is viable for re-development. Port-related infrastructure and key economic assets such as refineries and power stations will need to be assessed for their vulnerability to sea level rise. Many of these issues will be addressed by the new Planning and Policy Statement 20: Development and Erosion Risk, a consultation draft is due spring 2009.

Changes in tourism venues, with increasing numbers of people looking for domestic holiday venues may create a renewed interest in coastal locations as holiday destinations. This could result in increased interest in new capacity and regeneration of existing centres such as Blackpool, and Clacton, with possible demands for changes to sea fronts and impacts on coastal processes.

In developing the current coastal access initiative Natural England has sought to embrace the need for flexible responses that embrace coastal change, this is creating some demanding challenges.

### Evidence

The nuclear power station at Dungeness is maintained by a process of foreshore recharge that has implications for the evolution of the Dungeness foreland. Similarly, Sizewell is on a dynamic coast that is evolving in response to changes in sediment supply. In both cases it may well be considered essential to maintain these sites *in situ*. Elsewhere, increased tourism interests could place additional demands on locations that will inevitably change. A practical example of this was experienced at

Porlock in Somerset where the barrier beach was breached in 1996 and the South West Coast Path National Trail had to be rerouted inland.

**6. We believe there is a need to facilitate the migration and adaptation of key natural environment interests as the coast evolves, by appropriate use of regulation, advice and incentives.**

Strategic planning of coastal defence needs is indicating the need for extensive managed realignment (or a policy of no active intervention) in many south and east coast areas. Where this involves Natura 2000 sites it is likely to trigger a need for compensatory habitat. Some of these habitats, such as open grasslands used by over-wintering waterfowl, can be easily re-created. Other habitats such as invertebrate communities linked to ditch systems are harder to replace.

Brackish conditions within the upper reaches of tidal systems are also seriously threatened. The plants and animals that are most closely associated with brackish regimes are now confined to very narrow strips in many estuaries, and rare habitats such as freshwater tidal systems (at the landward end of long estuary systems where there is limited or no influence of salt water) have been largely lost.

There is a need for much better science to underpin our understanding of the recreatability of wetland systems within coastal grazing marshes. The concept of 'assisted migration' of freshwater and brackish coastal ecosystems needs to be developed and could form a valuable part of our campaigning and action programmes.

Evidence

Recent research highlights the potential scale of realignment, showing the scale of realignment over protected areas. Some estuaries such as The Medway and Swale estuaries are almost entirely fringed by Natura 2000 grazing marshes. It is therefore inevitable that there will be substantive changes to the mosaic of existing habitats.

Work by several European authors such as Aat Berenget has highlighted the levels of loss of freshwater to tidal transitional habitats within coastal plain estuaries. These issues have also been identified by consultants working for us who have highlighted the nature and scale of the problem.