



## **Natural England's Position on Flood and Coastal Erosion Risk Management**

### **Purpose**

This paper presents Natural England position on flood and coastal erosion risk management. Many of our positions in this paper complement the approach of Natural England's positions on Coastal Change. Annex 1 provides more information on the context for our involvement in flood and erosion risk management. This paper uses 'flood risk management' as shorthand for 'flood and coastal erosion risk management'.

### **Context**

Natural England's general purpose is to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development. Our aim in this arena is to influence the delivery of flood and erosion management so as to ensure the sustainable management of the natural environment and maximise the benefits to the environment and society.

Many rivers and coasts have been subject to human intervention, often over many centuries. While reducing flood and erosion risk to people and property, this approach has significantly affected the ways in which they evolve, limiting their ability to adapt to change and to 'shape' the natural environment and its wildlife and landscape interest.

Rivers and coasts provide large numbers of people with a means of enjoying the natural world and support a wide range of recreational activities. Through its impact on these environments, flood management can have an important role in enhancing access and recreational opportunities.

Landscapes are important to human well-being, culture and prosperity. Flood management, as a powerful shaper of the physical elements of the environment, has a key role in helping to retain the distinctive character of landscapes and, where sustainable, reducing the risk to other key features, such as the historic environment.

Until very recently such intervention was thought of in terms of 'flood and coastal defence'. Defra's 2004 *Making Space for Water* strategy formalised the shift to risk management and the wider use of sustainable approaches.

The impact of climate change is already evident at the coast, where sea-levels are rising. Recent large inland flood events in 1998, 2000 and 2007 are also indicative of predicted climate change impacts.

As a result of climate change the existing habitat and species interest of a large number of protected coastal wildlife areas (both behind and in front of seawalls) are unsustainable in their present locations.

Rivers and coasts are complex systems. Management in one place can have damaging impacts at a more distant location. Delivery of sustainable management requires the use of long-term, strategic approaches.

It is often difficult for local communities and land managers to understand and accept the rationale that underpins proposed changes in flood management policy. The need for adaptation is often regarded with suspicion. If society is to understand and embrace adaptation then we need more sophisticated

Flood and erosion risk management does not exist in isolation. There is a need to link strategic management policies for coasts, estuaries and rivers to the wider spatial planning system and agricultural and forestry policy.

Hard defences are a tried-and-tested protection against flooding (if built high enough). There will be a continuing need for hard defences in many circumstances to protect people, property and critical infrastructure. These should not proceed, however, without an assessment of the full range of flood risk management options, including non-structural interventions.

### **Summary of Natural England's Position on Flood and Erosion Risk Management**

#### **We believe:**

- Sustainable management of flood and erosion risk is best achieved by solutions that work with the physical and hydrological processes that shape coastal and riverine environments.
- As coasts and rivers evolve so the conservation, landscape and recreational interests of both protected areas and the wider environment will change. In such situations we will work positively with operating authorities to secure the best outcome for the natural environment.
- Strategic management of catchments, estuaries and coasts helps to deliver an integrated approach that optimises the contribution of the natural environment to sustainable flood and erosion risk management and maximises associated environmental and public benefits.
- Strategic management of flood and coastal erosion risk needs to anticipate climate change, contribute to its mitigation and help provide for innovative adaptation of the natural environment.
- Local communities should be involved by operating authorities in the development of sustainable approaches to flood and erosion risk management. Natural England will participate in this process when the natural environment is a major consideration in decision making.
- Appropriate spatial planning and more sustainable land management and use can help to reduce flood flows, make space for rivers and enable coasts to evolve naturally and thereby make a critical contribution to flood risk and erosion management.
- Private flood and erosion risk defences should not compromise agreed strategic plans for our coasts and rivers and need to be built and maintained in a way that respects the natural environment.

## Annex 1

### Natural England's position on flood and coastal erosion management

This paper sets out our draft position on flood and coastal erosion risk management for Natural England. It covers all aspects of flood and erosion management in relation to coasts, estuaries, rivers and wider catchments. It builds on the Coastal Policy Review, the Freshwater and Pollution Control Policy Review and the subsequent paper on *Outcomes from the Policy Review: Freshwater and Pollution Control*.

This draft has been developed with the support and advice of members of the Board (at Board Outcome Group meetings) and national, regional and area team staff.

#### Our aim

Nationally, flood and erosion risk management policy is set by Defra (most recently in *Making Space for Water*), while delivery in this work area is undertaken by the Environment Agency and other operating authorities (local authorities and internal drainage boards). Natural England is therefore not directly responsible for the delivery of flood and erosion risk management. However, we are a major stakeholder and the intention of this position statement is to shape the advice we offer to government and the operating authorities.

We propose that Natural England's aim is to *'influence the delivery of flood and erosion management so as to ensure the sustainable management of the natural environment and maximise the benefits to the environment and society'*.

In the right circumstances management of flood and erosion risk can also contribute multiple benefits, including natural resource protection, improved water quality, climate-change mitigation (through carbon sequestration and further flood risk reduction by created wetlands) and adaptation, biodiversity gain, access to the natural environment and recreational opportunities.

This approach is consistent with Natural England's Strategic Direction which seeks to improve the quality of environmental land and sea management through the development and adoption of sustainable practices that enable effective adaptation to climate change.

#### What is flood and coastal erosion management?

In summary, it is management to reduce the risks from flooding and erosion to people and property and, in some instances, to the natural environment. In river systems this means providing sufficient space to allow water to flow or be temporarily stored during high-flow events. At the coast it means reducing flood frequency to acceptable levels and, often, providing conditions that dissipate or absorb wave energy to slow erosion.

Flood and coastal erosion management may comprise flood warning and safety measures, capital engineering schemes that reduce the risk to people and property, and maintenance work (including maintenance of channels, control structures and flood embankments). Land management and use in the floodwater gathering grounds of catchments has largely been neglected in the past although it has a role in reducing some flood events.

Natural England acknowledges the important role of flood management in reducing risk to people and property and the contribution that this makes to society and the economy. And we agree with the Government's *Making Space for Water* strategy that sustainable flood and coastal risk management should deliver the greatest environmental social and economic benefit. However, historically, flood risk management practice has often been environmentally damaging.

Over the last 60 years many billions of pounds has been invested in channel and coastal modification, flood banks and land drainage. Before the early 1990's relatively little effort was made to ensure that such schemes also addressed environmental needs and opportunities. As a result, there is a legacy of damaged landscapes and many areas have a reduced capacity to support wildlife.

### **Rationale for Natural England's involvement in flood and erosion risk management**

We live in a densely populated island and as a result many of our coasts and rivers are subject to active management to address the twin issues of flooding and erosion. Without doubt flood risk management makes an important contribution to society and the national economy. However, there is frequently a direct impact on the natural environment from these activities that can affect both biodiversity and the landscape. It may also affect people's access to and use of the countryside and urban areas. Thus, there is clearly a direct link between much flood management activity and Natural England's responsibilities for the conservation, enhancement and management of the natural environment. The potential for flood and erosion risk management to affect the natural environment and for land management to contribute to sustainable flood risk management means that Natural England has a significant interest in this area.

### **Positions**

#### **1. Sustainable management of flood risk is best achieved by solutions that work with the physical processes that shape coastal and riverine environments.**

Coasts and river systems owe much of their biodiversity, geodiversity and landscape interest as well as their sense of 'wildness' to the shaping action of coastal and fluvial processes. Conserving this interest usually depends on conserving or restoring these processes so that they can act unhindered or harnessing them sustainably so that we use natural systems themselves to help reduce flood risk.

Many of our coasts and rivers are extremely dynamic and climate change resilience relies on the ability of such systems to adjust themselves to rising sea-levels or increased river flows.

### **Evidence**

The physical links between coastal and riverine processes and their associated habitats are well established. The link between a sandy beach and its associated sand dune system provides an obvious example. Solutions that use the ability of natural systems to absorb energy, and in so doing evolve and adapt, are inherently more cost effective than hard engineering solutions. In river environments, natural channel forms, such as braided streams, meanders or ox-bow lakes, are created by the river moving within its floodplain and all provide particular habitat niches for freshwater organisms. Restoration of these floodplain features can help to slow and store flows.

There is also a growing body of evidence of the need to carefully manage the sediment 'budget' of coastal systems so as to increase their robustness to climate change.

The traditional hard-defence interventions used to manage flood risk commonly disrupt these dynamic processes. While we acknowledge that some interventions will continue to have a necessary role in tackling certain categories of risk, Natural England argues that the adoption of more non-structural interventions that conserve or restore the functioning of natural systems will become ever more important in the face of climate change and increasing flood risk.

**2. As coasts and rivers evolve so the conservation interest, landscape and recreational interest of both protected areas and the wider environment will change. In such situations we will work positively with operating authorities to secure the best outcome for the natural environment.**

Our coasts and rivers have been evolving for thousands of years and this evolution is likely to accelerate with climate change. As a consequence of these changes the mosaic of habitats and species is continuously evolving as is the way in which we utilise these environments. There is a need to embrace these changes in the way we both conserve and use the natural environment. Natural England is giving consideration to how the selection and designation of protected sites can more dynamically reflect and accommodate environmental changes. And we are already seeking to use agri-environment funding, such as the Higher Level Stewardship, to promote adaptation and greater resilience of habitats in river and coastal floodplains.

### **Evidence**

Losses of coastal habitats such as saltmarsh pose a real risk to important habitats behind seawalls and to the seawalls themselves. Maintaining the seawall would exacerbate coastal squeeze while realignment can lead to major changes to fresh and brackish wetlands. These challenges were addressed by the EU LIFE Project *Living with the Sea* a joint initiative by English Nature, Environment Agency and Defra.

Given that many seawalls also provide a route for the coastal footpath there will also be a need for mechanisms that allow the coastal access corridor to evolve. This has been clearly recognised in Natural England's position statement on coastal access.

**3. Strategic management of catchments, estuaries and coasts helps deliver an integrated approach that optimises the contribution of the natural environment to sustainable flood and erosion risk management and maximises associated environmental and public benefits.**

There is a strong case that flood risk management should be managed strategically on a catchment or coastal cell basis rather than through a series of ad hoc interventions that simply address local risks.

The last 15 years have seen a number of successful initiatives aimed at improving strategic management of coasts (Shoreline Management Plans), rivers (Catchment Flood Management Plans) and wetlands (Water Level Management Plans).

### **Evidence**

Rivers and coasts are complex systems with interactions over long distances. Poorly planned management intervention in one place can cause unintended impacts elsewhere within the same system. This is illustrated by the impact of coastal defences that either intercept sediment movement along the coast, creating a need for additional engineering works to address a new erosion problem.

On many parts of the English coastline, these impacts are becoming increasingly apparent as the impacts of management have been embedded in coastal systems and we now see shortfalls in sediment supply both on the open coast and within estuaries. For example, a supply of muddy sediments is essential if mudflats and saltmarshes are to respond to sea-level rise.

Climate change, including sea-level rise and the increased probability of extreme rainfall events, strengthens the case for strategic, integrated approaches and for adaptation. Land use and management practices that are “flood-friendly” are also beneficial to soil conservation, landscape, biodiversity, woodland management, pollution reduction and carbon storage. They are complementary to flood defences that reduce flood risk to particular assets. Thus, flood risk management can be addressed as part of a package of land and water management measures that delivers a mix of public benefits. This will vary across catchments and coastal cells and hence underlines the need for strategic, integrated management.

### **4. Strategic management of flood and coastal erosion risk needs to anticipate climate change and help provide for the innovative adaptation of the natural environment.**

The UKCIP02 climate change scenarios include projected changes in levels of precipitation, temperature and sea level. The primary impacts on flood risk will be from changes in precipitation, extreme sea levels and coastal storms. Secondary impacts from temperature change will affect evaporation, plant moisture demands, soil moisture levels and the occurrence of snow and ice. The Government’s Foresight Future Flooding Project identified the following major impacts:

- increased coastal flood risk and erosion, especially in the South-East, due to relative sea level rise, surges and storms, with the risk of coastal flooding possibly rising by between four and ten times over the next 100 years;
- precipitation changes and consequent increased risks of between two and four-fold across the country with increased probability of river flooding in some areas, especially in the North and West.

### **Evidence**

Rising sea levels present significant challenges in parts of England. Coastal landscapes along with estuarine and freshwater ecosystems are facing significant change. These landscapes and ecosystems will need space inland if adaptation is to be successful.

It is important that we anticipate the climate change implications for coastal habitats over the next 100-year period and respond with a strategic programme of timely habitat adaptation and, where required, habitat replacement.

In some parts of England there is little or no capacity for managed realignment of the coast to address the impact of sea level rise and coastal erosion. Inland, continued urban development on floodplains is restricting the potential for the re-establishment of functioning ecosystems that can also act as flood storage areas.

Natural features have a key role in delivering resilience to climate change. New land management practices also have an important role in securing climate change adaptation. In some instances, schemes that work with coastal and fluvial processes may be more sustainable and economic in the face of climate change and increasing flood risk than traditional defences.

The accelerated 'rollback' response of barrier beach systems to rising sea-levels serves to illustrate the scale of these changes.

**5. Local communities should be involved by operating authorities in the development of sustainable approaches to flood and erosion risk management. Natural England will participate in this process when the natural environment is a major consideration in decision making.**

Communities rightly expect to be able to contribute to decisions on the future management of our coasts and rivers. Decisions involving managed realignment or to cease maintaining existing defences (because they are no longer economic) can easily become polarised leading to confrontation and a failure to reach a consensus on future management. Operating authorities have the lead role in this consultation process.

In adopting new approaches to flood management we need to recognise the legitimate concerns of communities in or close to floodplains or eroding cliffs and support appropriate adaptive measures such as the relocation of critical assets (e.g. electricity supply substations and water treatment works).

There is a clear need for more sophisticated approaches to stakeholder dialogue and to provide the public with better access to information. This was recently demonstrated by the *Coastal Futures* Humber Community Project that supports communities experiencing coastal change along the north bank of the Humber estuary between Hull and Spurn Point.

**Evidence**

The extent of public interest in changing flood management policies is apparent from a number of high profile cases. It is likely that the new range of strategic plans will propose a significant number of changes in flood management options. If these situations are not handled with care then there is the potential for conflict. The need for improved approaches has been recognised by Government and guidance for operating authorities is in preparation.

Given the number of protected areas associated with flood management activities it is inevitable that Natural England will find itself involved in community engagement around flood management activities and it is important that we are able to effectively explain our position.

**6. Appropriate spatial planning and more sustainable land management and use, can help to reduce flood flows, make space for rivers and enable coasts to evolve naturally and thereby make a critical contribution to flood risk and erosion management.**

Inappropriate development in floodplains and on eroding coasts can constrain options for future management. We need spatial allocations that provide the space for coasts and rivers to evolve, for example by using managed realignment to create more resilient coastal and river environments. The spatial planning system needs to be robust so as to limit inappropriate development in locations that are at risk of flooding or erosion.

As part of this approach Natural England advocates a whole-catchment – source-to-sea – approach to managing run-off and flood conveyance.

Changes in land management can help to create more absorbent catchments, where run-off is reduced as rainwater infiltrates the soil more readily. Alongside river channels, storage capacity can be increased by the creation of washland storage systems or the restoration of functioning floodplains that can store and slow floodwaters.

**Evidence**

The floods of 1998 and 2000 were a direct trigger for the development of robust national planning policies for floodplains. The need to develop a similar approach at the coast has been recognised by Government. There is also a need to plan for the relocation of extensive areas of habitats protected under European legislation that cannot be sustained at the coast.

Changes in land management, such as moorland grip-blocking in the uplands or alternative cropping regimes, are known to reduce run-off and have been proven to contribute to the reduction of flood flows at a local scale. Changes in land-use, which can involve creation of washland storage or restoration of floodplains, can also be used to provide flood storage and slow and flood flows.

**7. Private defences should not compromise agreed strategic plans for our coasts and rivers and need to be built and maintained in a way that respects the natural environment and does not inappropriately increase flood risk elsewhere.**

There a number of areas around the country where flood defences and coast protection works are maintained privately. The number of such defences is set to increase as operating authorities implement Defra policy and ‘withdraw maintenance’ from uneconomic seawalls. A similar approach is proposed for river systems.

Private defences in both coastal and river systems should not constrain or impact upon natural processes and the protection of people, property and critical infrastructure elsewhere.

In addition there a number of defences, maintained privately, that reduce flood risk to grazing marsh sites in coastal floodplains. It is likely that many of these will be unsustainable in the face of rising sea-levels and re-creation of habitats elsewhere may be needed to address legal responsibilities. The Government has provided a commitment to fund such works where they are necessary; however there is currently no clear mechanism to deliver this.

**Evidence**

Unregulated flood defences and coast protection schemes can damage the natural environment. The number of defences that are maintained privately is set to increase as a result of Government policy. The extent of private defences associated with Natura 2000 sites is currently being investigated. It is likely that the costs are of the order of several billion pounds over the next 50 years.

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