



6.8 Marine and coastal environments

Historically, measures to conserve and enhance the marine environment have not been as developed as for the terrestrial environment. Evidence of the effectiveness of responses to date is also limited and largely anecdotal. However, the current Marine Bill could be as significant for marine conservation in England as the 1981 Wildlife and Countryside Act was for terrestrial nature conservation. It should provide improved nature conservation delivery mechanisms and greater integration of management of our seas.

The geographical scope of the Marine Bill is England, Wales and the UK offshore area. The Bill proposes legislation in four broad policy areas through:

- the introduction of a new marine spatial planning system;
- streamlining marine licensing mechanisms;
- making improvements to the management of marine fisheries; and
- delivering a new mechanism for the recovery and protection of nature conservation in the marine environment, primarily by enabling the establishment of a network of Marine Conservation Zones, a type of marine protected area.

Government intends to establish a new Marine Management Organisation (MMO), to act as a champion for sustainable management of our seas. It would be responsible for strategic planning, operating a marine licensing system, fisheries management, monitoring and enforcement, and data management.

6.8.1 Marine Protected Areas

Currently, Marine Protected Areas (MPAs) within England's territorial seas (out to 12 nautical miles) are composed of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated under the Habitats and Birds Directives respectively, Ramsar sites and one Marine Nature Reserve.

Marine Nature Reserves (extending to 3 nautical miles offshore) can be designated using the Wildlife and Countryside Act 1981. However, only one Marine Nature Reserve (Lundy) has been designated in English waters.

Under the Habitats Regulations, the marine areas of SACs and SPAs are termed European Marine Sites. There are currently 28 SACs and 40 SPAs with marine components in England's territorial seas with work currently underway to identify further potential offshore sites (see Section 5.4.1.3) (including work by the JNCC beyond 12 nautical miles).

Effectiveness of Marine Protected Areas

In 2003, the UK, and subsequently Natural England, were commissioned by OSPAR to design a tool to assess the management effectiveness of existing MPAs (SACs and SPAs). Adapting a framework developed by the World Bank, the scorecard asked relevant authorities to consider and score aspects of MPA management, such as planning, process and achievement of ecological outcomes. Initial results from nine European Marine Sites in England in 2005-2007 revealed that, while the planning of management schemes was relatively effective, actual delivery of ecological outcomes scored less well. Reasons for this include increasing pressures on the marine environment, limited monitoring, insufficient resources and a lack of stakeholder engagement. Strengths included good compliance with regulations, good collaborative working between managers, and the existence of long-term management plans for many sites. In 2007, the OSPAR Commission accepted the scorecard as a tool to assess management effectiveness of MPAs in the OSPAR region (the maritime area of the North-East Atlantic).

6.8.2 Pollution

The Environment Agency regulates land-based effluent discharges to controlled waters (out to three nautical miles) through various domestic and European legislation dealing with issues such as Urban Waste Water, Bathing Waters and Pollution Prevention and Control. It has set up a programme to review all the permissions it issues that could have a significant effect on SACs and SPAs. This is in accordance with the provisions of the Habitats Regulations, and will run until 2010. Natural England has worked closely with the Environment Agency to develop joint guidance on relevant issues. This review continues to identify the main water quality concerns affecting designated sites, and has triggered management action in response.

In the wider marine environment, Defra (2005b) reported that levels of monitored contaminants have reduced significantly over recent years in response to implementing EC legislation on point source pollution control. However, implementation of the recently transposed EC Water Framework Directive will increase the number of pollutants requiring monitoring and control in the future.

The Maritime and Coastguard Agency is the lead organisation for response to marine incidents in the UK, and operates via the National Contingency Plan for Marine Pollution from Shipping and Offshore Installations (The National Plan). Natural England provides advice on the best action to take in order to reduce damage to marine conservation interests as a result of an incident or during recovery operations.

Response to the grounding of *MSC Napoli*

The natural environment was at risk following the deliberate grounding of the stricken vessel *MSC Napoli* approximately 1 mile from the coast at Beer Head, Devon in January 2007. The vessel had major structural damage and was carrying approximately 3,500 tonnes of heavy fuel oil, and a cargo that included significant quantities of hazardous chemicals. Natural England's role was to evaluate the potential risks to marine and coastal biodiversity around the Devon and Dorset coastline from any release of oil and chemicals, and to advise on suitable mitigation measures required. This stretch of the coastline is particularly rich in biodiversity and geodiversity, and includes a number of SSSIs, SACs, SPAs, a National Nature Reserve and a World Heritage Site.

A successful operation by salvagers to remove oil and chemicals from the vessel over a prolonged period meant that a potentially disastrous pollution incident was averted. Only a relatively small amount of oil was spilled over the course of the incident, and damage to local wildlife was kept to a minimum.



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6.8.3 Offshore renewable energy generation

Wind energy is a crucial element in delivering future renewable energy supplies in England (see Section 5.4.1). Natural England works proactively with government, developers and the Crown Estate at a strategic level to help guide wind-energy developments to the most appropriate locations and to ensure that natural environmental interests are taken into account in all wind-energy relevant strategies, policies and projects.

As an example, the London Array Offshore windfarm in the outer Thames area is, to date, one of the largest proposed windfarms (c250 turbines in 250 km² and 1 GW power). The outer Thames area supports internationally important numbers of red-throated diver *Gavia stellata* and the area is being considered as a possible marine SPA (see Section 5.4.1.3).

Following statutory consultation on the project's Environmental Impact Assessment, consent has been granted for a phased approach, with the initial partial build unlikely to significantly affect the red-throated diver population. Once constructed and operational, the effects will be closely monitored to inform whether or not a subsequent phase might proceed.

This development is a good example of partnership working with developers to achieve an acceptable outcome that will contribute to government's renewable energy generation targets while safeguarding internationally important nature conservation features.

6.8.4 Inshore fisheries

Where fishery management affects nature conservation interests, Natural England works closely with Sea Fisheries Committees and the industry. The Wash provides an example of where this joint working has led to the successful management of commercial fisheries, while safeguarding the wildlife interests (see box). It is hoped a similar sustainable fisheries approach will be adopted in other protected sites around the country where fisheries impacts have been identified, so that sites can be restored to, or maintained in, favourable condition.

Sustainable shellfish management in The Wash

The Wash is of exceptional importance to marine wildlife: it is designated as an SPA, Ramsar site, and SSSI, and forms part of The Wash and North Norfolk Coast SAC. Overfishing contributed to a collapse in shellfish stocks in the early 1990s with little signs of recovery for the next ten years. The number of natural mussel beds fell from over 30 in peak years to just one recorded bed in 1997. Cockle stocks also reached record lows. The impact on shellfish-eating waders (eg oystercatchers) and on the fishing industry was disastrous. Major die-offs of oystercatchers occurred in three separate winters in the 1990s with thousands of birds found dead. The cockle fishery was closed in 1997 because of the lack of stocks, and harvesting of mussels from the natural beds remained at unprecedented low levels for several years.

Following a series of scientific workshops, new research, new management measures and ten years of dialogue and partnership working between Natural England, the Eastern Sea Fisheries Joint Committee and the fishing industry, there has been a marked improvement in the health of both the wildlife and fisheries in the area. This work culminated in the development of Shellfish Management Policies setting out the sustainable management of the fisheries at the site.

In 2007 cockle stocks reached their second highest level since records began, and mussel stocks continue to recover and have reached levels not recorded since the late 1980s. Wader numbers are now generally similar to previous levels, although oystercatcher numbers remain around 50% lower than those present in the early 1990s. The successful management of The Wash has resulted in 15,000 ha of intertidal mud and sandflats within the SSSI now being assessed as recovering.



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6.8.5 Port development and maintenance

Port development usually involves evaluation of the potential environmental impact under the provisions of the Habitats Regulations because the majority of ports lie within or adjacent to SPAs and SACs. Application of the Habitats Regulations has, in the past, sometimes resulted in compensatory habitat creation measures after development has been consented, on the grounds that there are no alternatives and that there are imperative reasons of over-riding public interest. One such case is highlighted below.

Port development taking account of EC Habitats Directive

Harwich Haven Authority undertook channel deepening between 1998 and 2000. A series of key impacts to the habitat of the Stour and Orwell SPA were identified, including increased tidal propagation, one-off reductions in the extent of inter-tidal habitat exposed on each tide, and accelerated erosion of inter-tidal habitats due to reduced sediment availability. As a result of these impacts, a package of compensatory measures was agreed which included managed realignment on 16.5 ha of arable land at Trimley (The Trimley Marshes Habitat Creation scheme) to offset the loss of tidally exposed mudflat (4 ha). In addition, a sediment replacement scheme, returning maintenance-dredged sediment within the Stour Estuary, was established as part of ongoing measures to offset sediment draw-down. Today, this sediment feeding programme involves some 600,000 wet tonnes per year. The success of the compensatory measures have been confirmed through the establishment of a major monitoring programme (Morris and Gibson, 2006).



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6.8.6 Coastal management planning

In order to tackle potential conflicts between competing interests in the coastal environment, integrated planning has been developed, specifically Coastal Habitat Management Plans and Shoreline Management Plans.

Coastal Habitat Management Plans (CHaMPs) are technical documents that have been prepared for SAC/SPA/Ramsar complexes where there are conflicts between flood management activities and the ecological requirements of sites. On these sites it may not be practical to maintain all features in their current location over a 30-100 year timescale. Operating authorities (usually the Environment Agency) and Natural England are responsible for preparing CHaMPs. CHaMPs quantify predicted habitat change (loss and gain) and recommend measures to prevent or offset habitat losses. These include modifying flood and coastal defence options to avoid damage, or identifying the necessary habitat restoration or recreation works to compensate for unavoidable losses.

Shoreline Management Plans are being developed around the English coastline. The aims of these non-statutory plans are to increase understanding of the long-term risks associated with coastal processes, and to inform sustainable policies for coastal defence that reduce risk to people and also to the developed, historical, and natural environments. CHaMPs provide information for Shoreline Management Plans on the requirements of the Birds and Habitats Directives. By incorporating the CHaMP recommendations, the Shoreline Management Plans should be compliant with the Habitats Regulations, and ensure that there will be no adverse effect on the SACs and SPAs.

6.8.7 Managed realignment

Coastal squeeze is already reducing the extent of saltmarsh in parts of England, with an estimated loss of over one per cent annually since 1994. This change is ongoing and unstoppable, but the impacts can be addressed by implementing strategies to restore intertidal habitat in selected areas of the coast. Managed realignment is a so-called 'soft engineering' technique. Rather than working against nature (for example by building high walls to keep the sea out) it is based on the landward migration or creation of intertidal habitats. New intertidal habitat provides space for floodwater and deposited sediment and so breaks the power of incoming tides and waves and reduces the risk of flooding within the estuarine system. Although more land is needed than a hard defence, the length of sea wall to maintain is reduced.

Currently, managed realignment is largely seen as a nature conservation response because very nearly all recent examples have been undertaken as a specific habitat-creation measure. However, managed realignment provides a wide range of benefits:

- sustainable and effective flood and coastal defence technique;
- long-term strategy adapting to sea level rise;
- more economically efficient than the policy of 'holding the line';
- habitat creation;
- reducing long-term costs of flood and coastal defence;
- potential benefits for biodiversity, landscape, public access, archaeological and local economies.

As an example, the Alkborough realignment on the Humber estuary, which is one of the largest in western Europe, is designed primarily to absorb tidal surges and to reduce pressure on flood defences elsewhere, yet also creates extensive wildlife habitat. This is an excellent example of a multi-functional approach that delivers a range of both wildlife and social benefits.

Although concerns about the loss of agricultural land and the reluctance to abandon hard sea defences continue to limit the use of managed realignment, between 1994 and 2007 there were 1,028 ha of realignment in the UK. Most of this was achieved by breaching or re-aligning sea-walls, with the rest achieved by regulated tidal exchange, ie where a sluice is put into the sea-wall to allow controlled seawater inundation. Monitoring of habitat development and species colonisation on realignment sites has shown that saltmarsh vegetation and associated fauna can colonise sites rapidly, although the rate of development is highly dependent on the elevation of the site relative to tidal range and the accretion or erosion of sediment (eg Boorman 2003). Despite this progress, however, the current rate of habitat creation is still not sufficient to achieve the UK BAP target of 'no net loss' of intertidal habitat.

The economics of managed realignment

Economic valuation of the benefits of the natural environment can have an important impact on the outcome of appraisals of different policy options.

For example, below are three case studies which attempted to identify and value all the costs and benefits of maintaining or enhancing existing flood defences (termed 'holding the line') versus managed realignment schemes. Managed realignment can generate intertidal habitats which provide numerous benefits for example to fisheries, nutrient recycling, carbon storage and biodiversity. In contrast holding the line can lead to the loss of intertidal habitats but would protect areas of agricultural land and preserve some adjacent freshwater habitats. The case studies below only involved the loss of agricultural land and possibly some freshwater habitat for a compensating gain of saltmarsh etc. People, property and nature conservation designated sites were not affected.



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- 1) A clear conclusion of a Poole harbour appraisal was that holding the line is very unlikely to be desirable when account is taken of the values of the services provided by the natural environment (EFTEC 2007).
- 2) A Humber estuary appraisal concluded that managed realignment can provide net benefits over a sufficiently long time period (generally greater than 25 years) relative to holding the line. They concluded "...given the caveats and using, for the most part, conservative assumptions and estimates, the Humber appraisal shows that limited managed realignment assessed over an extensive spatial and temporal scale and with non-constant discounting provides an economic efficiency gain." (Turner *et al.* 2007)
- 3) An appraisal in the Blackwater estuary concluded that over a 50-100 year timescale the benefits (the value of habitat created and carbon buried) is greater than the costs. Positive net benefits are achieved even when using a conservative value for habitat created. The analysis reveals that managed realignment can provide major benefits in carbon and nutrient storage plus habitat creation. (Shepherd *et al.* 2007)

Lundy No-Take Zone

The Lundy No-Take Zone was established in 2003. This 330 ha area is the only statutory No-Take Zone for nature conservation in England.



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Within 18 months of its establishment, there were significantly higher numbers of lobsters (*Homarus gammarus*) in the No-Take Zone than in surrounding fished areas. By 2006, there were seven times more lobsters in the No-Take Zone than outside and they were significantly larger. For the first time in 2007, increased numbers of juvenile lobsters were seen in the fished areas around the No-Take Zone suggesting spillover, and an indication of the potential socio-economic benefits of Marine Protected Areas. It is hoped that the Marine Bill provisions will not only result in the establishment of many more Marine Protected Areas, including No-Take Zones, but also deliver further potential benefits from Marine Protected Areas for the fishing industry and communities.

Chapter 6 Responses

Evidence gaps

Areas where we believe we need more evidence on the condition of England's natural environment, how it is used and the most effective mechanisms to address the challenges we face.

- 1 Better evidence on the individual and comparative effectiveness of specific mechanisms and response strategies.
- 2 Evidence on the requirements for landscape-scale adaptation to pressures.
- 3 Better evidence on the distribution, use and valuation of ecosystem services.