10 PROTECTION AND CONSERVATION OF BIODIVERSITY AND ECOSYSTEMS

OSPAR is working to protect vulnerable species and habitats and ecological processes in the North-East Atlantic. Fishing is a key pressure leading to declines in some species and loss of vulnerable seabed habitat. Climate change will increase the pressure on biodiversity. Progress has been made in establishing marine protected areas (MPAs) in coastal waters and in protecting cold-water corals from destructive fishing practices. The target of reducing the rate of loss of biodiversity has not yet been reached.

OSPAR Contracting Parties should cooperate

- → to ensure that biodiversity protection is fully taken into account in the management of human activities and in marine spatial plans;
- → to develop targeted measures to support the protection and conservation of all threatened and declining species and habitats;
- → to establish additional MPAs, particularly beyond the coasts and in areas beyond national jurisdiction, and ensure that OSPAR MPAs are effectively managed;
- → to develop a scheme for assessing and monitoring biodiversity status at the ecosystem scale.

Key OSPAR assessments

- → Background Documents for the OSPAR List of threatened and/or declining species and habitats
- → Report on progress in developing the OSPAR network of MPAs

Biological diversity – or biodiversity – is the term given to the variety of life on Earth and the natural patterns it forms. Biologically diverse oceans and seas are important for the proper functioning of marine ecosystems. They are also of high value to man in providing services, sustainable uses and as a basis for human health and livelihoods. Many marine species, habitats and ecosystems are sensitive to pressures from human activities and there is general agreement that marine biodiversity globally is facing unprecedented threats as a result of human activities in the marine environment, land-based inputs to the sea and climate change. Since 1998, OSPAR has been working under its Biodiversity and Ecosystems Strategy to identify, protect and conserve those species, habitats, and ecosystem processes in the North-East Atlantic which are most vulnerable to harm. This work complements the work under the Biodiversity and Ecosystems Strategy on human uses of the sea → CHAPTERS 8 and 9.

In 2002, both at the World Summit on Sustainable Development (Johannesburg) and in the context of the UN Convention on Biological Diversity, world governments committed to achieving a significant reduction in the rate of biodiversity loss at the global, regional and national level by 2010. OSPAR's work is one of the key regional processes for implementing the Convention on Biological Diversity in the North-East Atlantic, complementing work done under various EU Directives and measures under the Bern Convention on the Conservation of European Wildlife and Natural Habitats, the Bonn Convention on Migratory Species, and other relevant instruments → TABLE 10.1.

OSPAR Strategy objective for biodiversity and ecosystems
To protect and conserve the ecosystems and the biological diversity of the maritime area which are, or could be, affected as a result of human activities, and to restore, where practicable, marine areas which have been adversely affected.

The Strategy includes the following actions:

- → Identify those marine species, habitats or ecosystems that need to be protected, conserved or restored.
- → Adopt measures within the sphere of competence of OSPAR for the protection of those species and habitats, or draw the attention of other competent authorities to the need for such measures.
- → Establish an ecologically coherent network of well managed marine protected areas by 2010.

What are the problems?

Pressures are still present and even increasing

Pressures such as the removal of species (e.g. by fishing), loss of and damage to habitats, the introduction of non-indigenous species → CHAPTER 9, obstacles to species migration and poor water quality are still present. Some pressures are even increasing in parts of the OSPAR area and all can act in synergy or be exacerbated by climate change. These pressures result in loss of biodiversity, including declines in the abundance and variety of species and habitats. Interruption of ecological processes, such as spawning, migration, and biological communication, may also occur.

TABLE 10.1 *International and regional framework for protection and conservation of biodiversity.*

	Framework	Objective
Global	Convention on Biological Diversity (CBD)	To conserve biological diversity To use biological diversity in a sustainable fashion To share benefits from the utilization of genetic resources fairly and equitably
	Bonn Convention on Migratory Species (CMS)	To conserve terrestrial, marine and avian migratory species throughout their range
	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	To ensure that international trade in specimens of wild animals and plants does not threaten their survival
	International Whaling Commission (IWC)	To provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry
Europe and North–East Atlantic	OSPAR Convention	To protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely affected
	EU Habitats Directive (92/43/EEC)	To promote the maintenance of biodiversity by requiring EU Member States to take measures to maintain or restore natural habitats and wild species at a favourable conservation status
	EU Birds Directive (79/409/EEC)	To conserve all species of naturally occurring birds in the wild state in territory of the EU Member States
	EU Marine Strategy Framework Directive (2008/56/EC)	To establish a framework within which EU Member States shall take the necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest
	EU Water Framework Directive (2000/60/EC)	To establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater
	Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)	To conserve wild flora and fauna and their natural habitats To promote cooperation between states To monitor and control endangered and vulnerable species To assist with the provision of assistance concerning legal and scientific issues
Sub-regions of the North-East Atlantic	Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS)	To promote close cooperation amongst Parties with a view to achieving and maintaining a favourable conservation status for small cetaceans
	Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)	To reduce threats to cetaceans in Mediterranean and Black Sea waters and improve our knowledge of these animals
	Trilateral Governmental Cooperation on the Protection of the Wadden Sea	To achieve, as far as possible, a natural and sustainable ecosystem in which natural processes proceed in an undisturbed way
	The North Atlantic Marine Mammal Commission (NAMMCO)	To contribute through regional consultation and cooperation to the conservation, rational management and study of marine mammals in the North Atlantic
Adjacent regions	Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)	To maintain migratory waterbird species in a favourable conservation status or to restore them to such a status
	Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM)	Viable populations of species Favourable conservation status of Baltic Sea biodiversity Thriving and balanced communities of plants and animals

Cold-water corals at 200 m depth off the coast of Norway

Northern right whale and calf (left); blue whale (right)

Severe decline in some species and habitats

The most sensitive features are those that are easily damaged and slow to recover. Some never recover. Reefs of the cold-water coral *Lophelia pertusa* are slow-growing and delicate and can be severely damaged by bottom trawl fisheries. The common skate is a long-lived species that has a slow rate of reproduction and is particularly vulnerable to capture by bottom-trawl fisheries. Species that are near extinction over their entire range include the Azorean limpet, the European sturgeon, and the northern right whale. Numbers of blue whales in the OSPAR area are still at a low level and recovering only very slowly, despite more than 40 years protection from commercial whaling.

Lack of attention to conserving biodiversity

Historically, the management of human activities in the marine environment has not paid enough attention to conserving biodiversity. One of the reasons is that clear evidence of the impacts on species, habitats and ecological processes has only developed in recent decades and still remains scarce in some instances, especially for deeper waters. Another reason is that long-term sustainability has not always been the focus of management. Furthermore, the importance of biodiversity to the proper functioning of habitats is still being debated. OSPAR is working with other international bodies to remedy this, but national management plans still pay too little attention to impacts on species and habitats. Scientific knowledge and practices for assessing biodiversity status are still evolving and an adaptive approach to management planning needs to be used, taking account of better scientific evidence as it becomes available.

Pressures at the coast differ from those offshore

Coastal waters contain feeding grounds, spawning and nursery areas, and feature on migration routes for seabirds and some fish species. These areas also host intense and varied human activities, which exert a wide range of pressures and can lead to the damage or loss of key habitats in estuaries and intertidal areas. Salt marshes and seagrass beds, which are highly productive and act as natural carbon sinks, are under pressure from relative sea-level rise and coastal development. Key areas of the shelf seas, including offshore banks and reefs, and frontal zones between different water masses, play important roles in pelagic productivity. Fishing is recognised as a key pressure on species and habitats in the shelf seas and there continues to be a need for information about ecologically important areas to guide improvements in management.

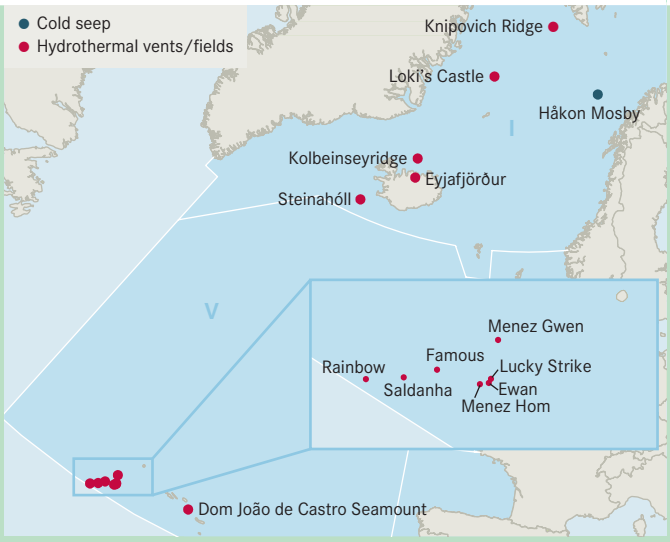
Areas deeper than 200 m cover about 83% of the OSPAR area. The protection of marine biodiversity from human activities such as fishing or the future development of seabed mining and bioprospecting in these vast deep-sea areas is particularly challenging. The full extent of some specialised deep-sea habitats, for example hydrothermal vent fields → **BOX 10.1**, is still being revealed.

Salt marsh

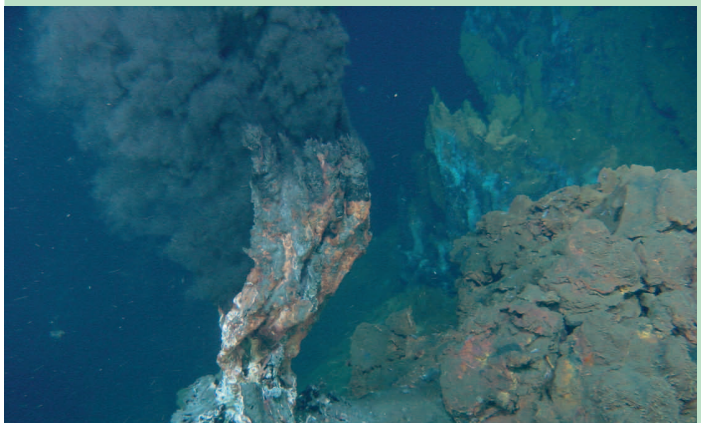
BOX 10.1 Deep-sea vents and seeps

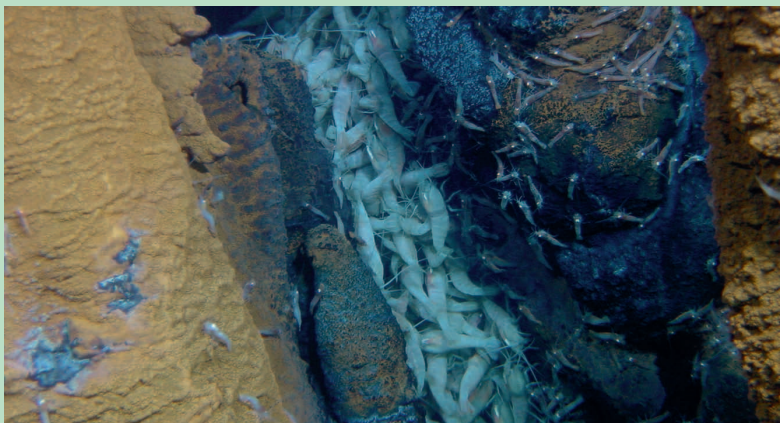
Hydrothermal vents occur around submarine hot springs or super-heated jets. The mineral-rich water supports biological communities that derive their energy from dissolved chemicals, such as hydrogen sulphide (H_2S), rather than from solar radiation. One typical form of hydrothermal vent, a 'black smoker' is shown in the photo below (left). The plume consists of hot water escaping from the seafloor containing (black) metal sulphides. Chemotrophic bacteria metabolise the H_2S and support a unique community of animals that feed on them, or with which they have long-term interactions. The photo below (right) shows a specialised community of hydro-thermal vent shrimps. Hydrothermal vent fields in the OSPAR area (see map) occupy small areas of the seabed at depths of 850 to 4000 m, associated with the Mid-Atlantic Ridge in Regions I and V. Vents are relatively short-lived, generally existing for only a few decades, thus the exact number and locations of vents are not known.

Cold seeps occur where methane and H_2S are released from the seabed at near-ambient temperatures and also provide energy for a bacterial-based food chain. They are common in European waters and can form a variety of large-scale to small-scale features on the seafloor. The Håkon Mosby mud volcano is one of the largest such features in the OSPAR area, measuring over 1 km across. The communities on different cold seeps frequently differ in terms of species composition. This indicates that there is a high variability in ecosystem processes and associated biodiversity at different spatial scales.



The physical structures of vents in particular may be at risk from activities such as mineral extraction, bioprospecting and, in future, tourism. Scientific research can also cause physical damage. Protected area designation is among the approaches being taken forward to manage human impacts on hydrothermal vents. OSPAR has agreed a code of conduct for responsible marine research in the deep seas and High Seas of the OSPAR area.





Marine biodiversity still poorly known and understood

While knowledge of biodiversity in shallow, coastal areas has much improved over the past few decades, there are still large gaps with respect to the organisms and communities living in areas deeper than 200 m. Bacteria and viruses are thought to play a crucial role as drivers of food webs and global biogeochemical cycles, but this is not sufficiently understood. There are especially gaps in under-standing how they will respond to environmental change caused by human activities, including climate change. There are also major gaps in understanding of bottom habitats and their functions for benthic species and communities. There is an ongoing need for major exploratory research initiatives to address these various gaps and support efforts to protect and conserve ecosystems and biodiversity.

What has been done?

Species and habitats under threat and/or in decline

To help set priorities, OSPAR's work on protection and conservation of biodiversity has started from an identification of those species and habitats most in need of protection. The OSPAR List of threatened and/or declining species and habitats was agreed in 2003 and extended in 2008 → **TABLES 10.2** and **10.3**. It was based on agreed criteria for decline (expressed in terms of population, distribution and condition of species, and distribution, extent and condition of habitats) and threat (expressed in terms of there being a direct or indirect link to human activity). There has been no revision of the list associated with the present quality status assess-ment (i.e., the QSR 2010). Establishing trends for all species and habitats on the list is challenging, but recent information for some features is presented in the following sections and in the background assessments to this Chapter.

The key pressure affecting the species listed is the removal of target and non-target species, mainly as a result of fishing, while other key pressures include habitat loss or damage, and pollution. Large-scale oceanographic changes associated with climate change, including ocean acidification, rising sea level and increasing sea temperatures, are likely to become increasingly important in the coming decades. Other pressures include the introduction of non-indigenous species and litter. Some species suffer land-based pressures, such as predation at seabird breeding sites and barriers to migration through freshwater areas for those migratory fish species with life stages in both fresh and salt water. The three whale species listed were historically depleted as a result of commercial whaling until the 1960s.

The most important pressures affecting habitats are habitat loss, for example from coastal development or mineral extraction, and habitat damage, in many cases through bottom trawling.

Working to protect species and habitats

OSPAR has been working to identify and implement the best means of protection for these threatened and/or declining species and habitats, many of which are affected by multiple pressures from human activities, often acting cumulatively. Some species and habitats have benefited from improvements in the quality of the marine environment over the past 20 years achieved as a result of OSPAR's work on eutrophication, hazardous substances, offshore oil and gas production and the phasing out of several types of waste disposal.

OSPAR has collected and mapped available information on the distribution of threatened and/or declining habitats → **FIGURE 10.1** and has urged the relevant fisheries authorities to take this information into account in actions to protect these habitats from fisheries-related impacts.

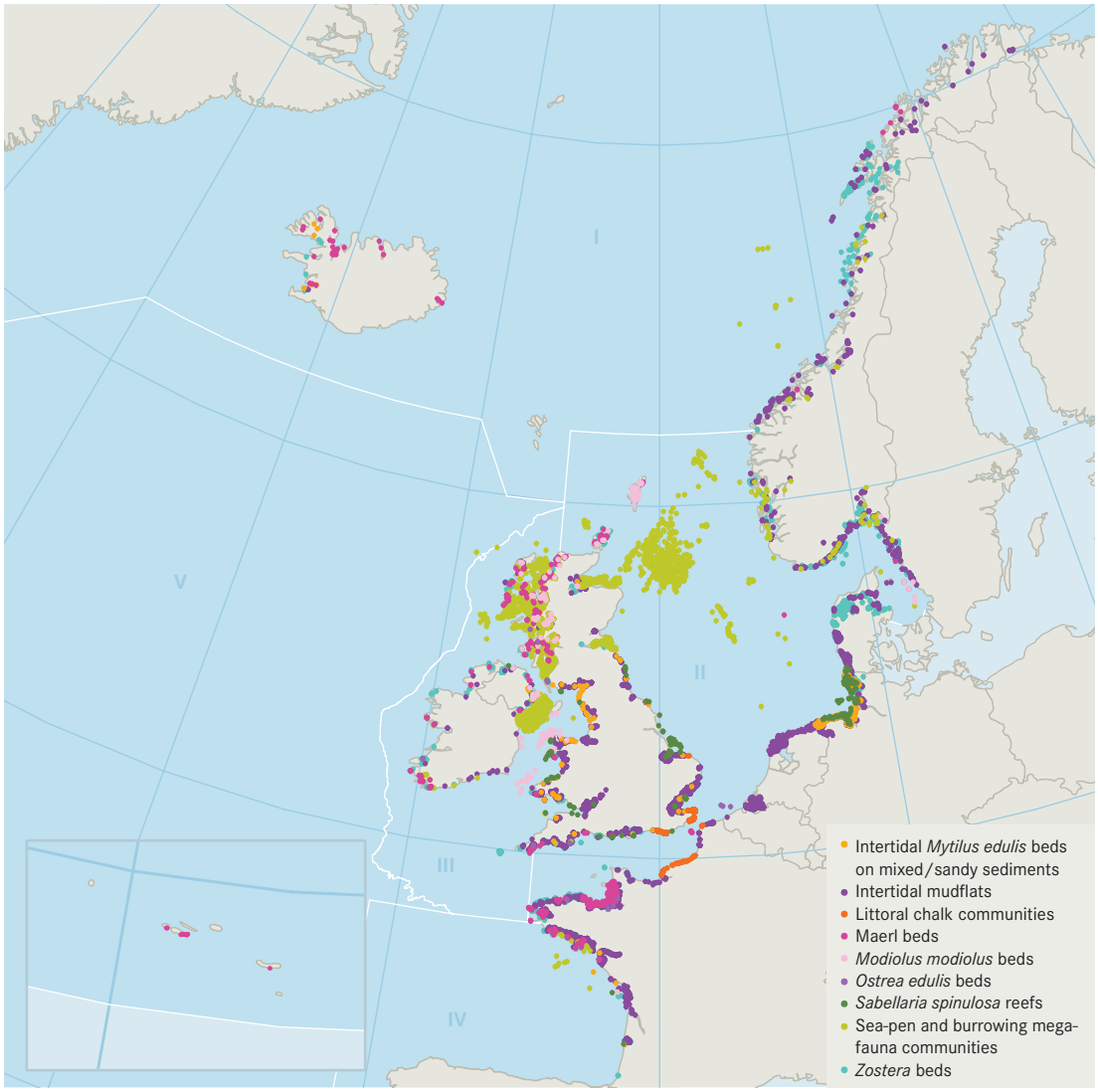


FIGURE 10.1 *Reported information on the distribution of threatened and/or declining coastal and shelf-sea habitats (January 2010). Progress has been made in collating information on the distribution of each habitat considered to be threatened and/or declining. To date, the habitat-mapping programme has mainly provided information on habitat distribution (i.e. geographical coverage). The programme is based on the supply of data by OSPAR countries, so information on habitats in areas beyond national jurisdiction is not targeted. Data for deep-sea habitats are shown in Box 10.3. Data for the coral gardens and Cymodocea meadows are not yet available.*

TABLE 10.2 *OSPAR List of threatened and/or declining species adopted in 2003 ([1]species added in 2008) and the current key pressures with impacts on the species listed.*

	Species	Scientific name	Regions where species occurs (○) and has been recognised by OSPAR to be threatened and/or declining (●)					Key pressures
			I	II	III	IV	V	
Invertebrates	Ocean quahog	*Arctica islandica*	○	●	○	○		
	Azorean barnacle	*Megabalanus azoricus*					●	
	Dogwhelk	*Nucella lapillus*	○	●	●	●	○	
	Flat oyster	*Ostrea edulis*	○	●	○	○		
	Azorean limpet	*Patella aspera*					●	
Birds	Lesser black backed gull	*Larus fuscus fuscus*	●					
	Ivory gull[1]	*Pagophilia eburnea*	●					
	Steller's eider	*Polysticta stelleri*	●					
	Little shearwater	*Puffinus assimilis baroli*					●	
	Balearic shearwater[1]	*Puffinus mauretanicus*		●	●	●	●	
	Black-legged kittiwake[1]	*Rissa tridactyla*	●	●	○	○	○	
	Roseate tern	*Sterna dougallii*		●	●	●	●	
	Iberian guillemot	*Uria aalge – Iberian population*				●		
	Thick-billed murre[1]	*Uria lomvia*	●					
Fish	European sturgeon	*Acipenser sturio*		●	○	●		
	Allis shad	*Alosa alosa*		●	●	●		
	European eel[1]	*Anguilla anguilla*	●	●	●	●	●	
	Houting	*Coregonus lavaretus oxyrinchus*		●				
	Salmon	*Salmo salar*	●	●	●	●		
	Sea lamprey	*Petromyzon marinus*	●	●	●	●		
	Portuguese dogfish[1]	*Centroscymnus coelolepis*	●	●	●	●	●	
	Gulper shark[1]	*Centrophorus granulosus*				●	●	
	Leafscale gulper shark[1]	*Centrophorus squamosus*	●	●	●	●	●	
	Basking shark	*Cetorhinus maximus*	●	●	●	●	●	
	Common skate	*Dipturus batis*	●	●	●	●	●	
	Spotted ray	*Raja montagui*		●	●	●	●	
	Spurdog[1]	*Squalus acanthias*	●	●	●	●	●	
	Porbeagle[1]	*Lamna nasus*	●	●	●	●	●	
	Thornback skate/ray[1]	*Raja clavata*	○	●	○	○	○	
	White skate[1]	*Rostroraja alba*		●	●	●		
	Angel shark[1]	*Squatina squatina*		●	●	●		
	Cod	*Gadus morhua*	○	●	●	○	○	
	Orange roughy	*Hoplostethus atlanticus*	●				●	
	Bluefin tuna	*Thunnus thynnus*					●	
	Long-snouted seahorse	*Hippocampus guttulatus*		●	●	●	●	
	Short-snouted seahorse	*Hippocampus hippocampus*		●	●	●	●	
Reptiles	Loggerhead turtle	*Caretta caretta*				●	●	
	Leatherback turtle	*Dermochelys coriacea*	●	●	●	●	●	
Mammals	Bowhead whale	*Balaena mysticetus*	●					
	Blue whale	*Balaenoptera musculus*	●	●	●	●	●	
	Northern right whale	*Eubalaena glacialis*	●	●	●	●	●	
	Harbour porpoise	*Phocoena phocoena*	○	●	●	○	○	

TABLE 10.3 *OSPAR List of threatened and/or declining habitats adopted in 2003 (¹habitats added in 2008) and the current key pressures with impacts on the habitats listed.*

	Habitat	Regions where habitat occurs (○) and has been recognised by OSPAR to be threatened and/or declining (●)					Key pressures
		I	II	III	IV	V	
Coastal habitats	Littoral chalk communities		●				
	Intertidal *Mytilus edulis* beds on mixed and sandy sediments		●	●			
	Intertidal mudflats	●	●	●	●		
	Ostrea edulis beds		●	●	●		
	Zostera beds	●	●	●	●		
	Cymodocea meadows[1]				●		
Shelf sea habitats	*Modiolus modiolus* beds	●	●	●	●		
	Sabellaria spinulosa reefs	○	●	●	○	○	
	Maerl beds	○	○	●	○	○	pH↘
	Sea-pen and burrowing megafauna communities	○	●	●	○		
Deep-sea habitats	*Lophelia pertusa* reefs	●	●	●	●	●	pH↘
	Coral gardens[1]	●	●	●	●	●	pH↘
	Carbonate mounds	○				●	
	Deep-sea sponge aggregations	●		●	●	●	
	Oceanic ridges with hydrothermal vents/fields	○				●	
	Seamounts	●			●	●	

KEY TO TABLES 10.2 AND 10.3: Climate change; pH↘ pH changes; Hydrological changes; Hazardous substances; Oil pollution; Nutrient and organic enrichment; Litter; Underwater noise; Barriers to species movement; Death or injury by ship strikes; Siltation rate changes; Habitat damage; Habitat loss; Microbial pathogens; Introduction of non-indigenous species and translocations; Removal of target and non-target species; Predation; Loss of prey species; Threats outside the OSPAR area

OSPAR has identified a range of actions to be taken to protect particular species and habitats. These include:

- Raising awareness of the species and habitats and their key pressures among stakeholders and wider society.
- Taking into account threatened and/or declining species and habitats in environmental impact assessment processes.
- Supporting improved identification of threatened species (sharks, skates and rays, sturgeon) among key users of the sea (e.g. fishermen).
- Protection of breeding sites (seabirds, including roseate tern and thick-billed murre).
- Restoration of habitats and protection of migration corridors (diadromous fish).
- Reintroduction programmes (European sturgeon).
- Improved coordination of monitoring of species, habitats and pressures, and sharing of information, for example, on sightings (turtles, basking shark).
- Action to reduce by-catch (sharks, skates, rays, Balearic shearwater, harbour porpoise, turtles).
- Establishing marine protected areas (MPAs) to protect important functional areas for species and habitats, including key life stages (shark, skates and rays).

Thick-billed murres

Several other international organisations and frameworks contribute to protection and conservation of marine biodiversity → **TABLE 10.1**. OSPAR needs to coordinate its work with the efforts of these organisations and to provide a framework to harmonise and support consistent actions at national level. Conservation efforts for many species need to be supported by further research, especially on demographics and life history. Improved mapping of the distribution, extent and condition of seabed habitats is vital to support management. Better coordination of monitoring and information collection is also important.

A network of MPAs is under development

OSPAR is developing an ecologically coherent network of well-managed MPAs for the North-East Atlantic and has set the aim for this to be established by 2010. The network is intended to make a significant contribution to the sustainable use, protection and conservation of marine biodiversity including in areas beyond national jurisdiction. Both the network and the aims set for it → BOX 10.2 add to, and complement, the system of Natura 2000 protected areas for the marine environment established under the EU Birds Directive and the Habitats Directive and other national measures. Specifically, the OSPAR network has extended geographical coverage and the ecologically based criteria used to select OSPAR MPAs are broader than the Natura 2000 criteria and include the need to represent a more extensive range of species and habitats. OSPAR's aim of an ecologically coherent network seeks to ensure that the MPAs interact with, and support, the wider marine environment as well as other MPAs. This is particularly important for highly mobile species so as to safeguard the critical stages and areas of their lifecycle (such as breeding, nursery and feeding areas). Appropriate management is vital to achieve good ecosystem health and functioning within and outside MPAs. The most appropriate management measures to achieve the objectives of each MPA need to be defined in a management plan. Zoning, seasonal closures, and restrictions on certain activities (e.g. fishing effort management, gear restrictions) are all management approaches that could be employed in MPAs.

BOX 10.2 Aims of the OSPAR MPA network

Marine protected areas are areas for which protective, conservation, restorative or precautionary measures have been put in place to protect and conserve species, habitats, ecosystems or ecological processes of the marine environment on a temporary or permanent basis.

The OSPAR network of MPAs has the following aims:
- To protect, conserve and restore species, habitats and ecological processes which have been adversely affected as a result of human activities.
- To protect, conserve and restore species, habitats and ecological processes which best represent the range of these features within the OSPAR maritime area.
- To prevent degradation and damage to species, habitats and ecological processes, following the precautionary principle.

The selection of areas for inclusion in the network takes into account the following criteria, based on best available scientific expertise and knowledge:
- Threatened or declining species and habitats/biotopes
- Important species and habitats/biotopes
- Ecological significance
- High natural biological diversity
- Representativity
- Sensitivity
- Naturalness

MPAs in areas beyond national jurisdiction

OSPAR has agreed that areas outside the jurisdiction of OSPAR countries will be considered for inclusion in the MPA network. Several ecologically significant and/or vulnerable areas have been identified in these areas beyond national jurisdiction. The mandates for regulatory measures to protect these areas are shared by a number of bodies under the United Nations Convention on the Law of the Sea (UNCLOS), including OSPAR. As a result, common principles for the protection of vulnerable marine ecosystems in these areas must be drawn up through international cooperation and collaboration.

EcoQOs provide tools for considering wider biodiversity status

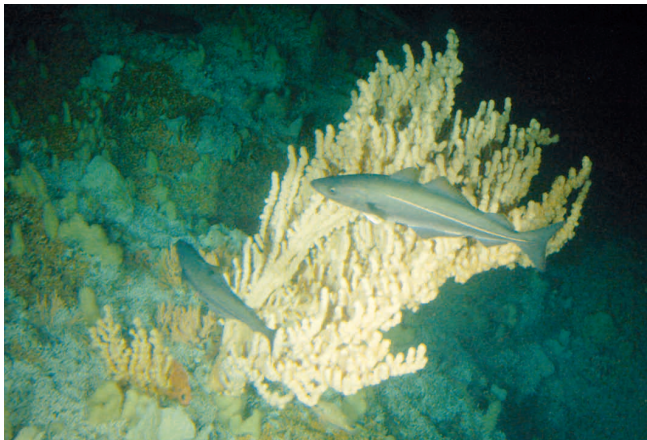
OSPAR's Ecological Quality Objectives (EcoQOs) for the North Sea provide a further tool to support the protection of biodiversity and ecosystems. EcoQOs on seals and seabird populations consider developments in biodiversity status beyond endangered species and habitats. Other EcoQOs provide a link between elements of biodiversity and human activities. EcoQOs are seen as an important component of an ecosystem approach to management → CHAPTER 11.

Did it work?

Progress on protecting some species and habitats

Work by OSPAR to raise awareness with key fisheries management authorities has contributed to the protection of cold-water coral reefs → BOX 10.3. Following similar efforts in relation to littoral chalk communities, protection and monitoring schemes for this habitat are now included in national and EU legislation. These coastal exposures of chalk are rare in Europe and large parts have been modified by coastal defence. This has led to the loss of micro-habitats on the upper shore and the removal of splash-zone communities (including unique algal communities) which have also been affected by poor water quality. As a result of the steps taken, the overall prognosis for preventing further deterioration in the current state of the habitat is good.

Lophelia pertusa corals off the Norwegian coast

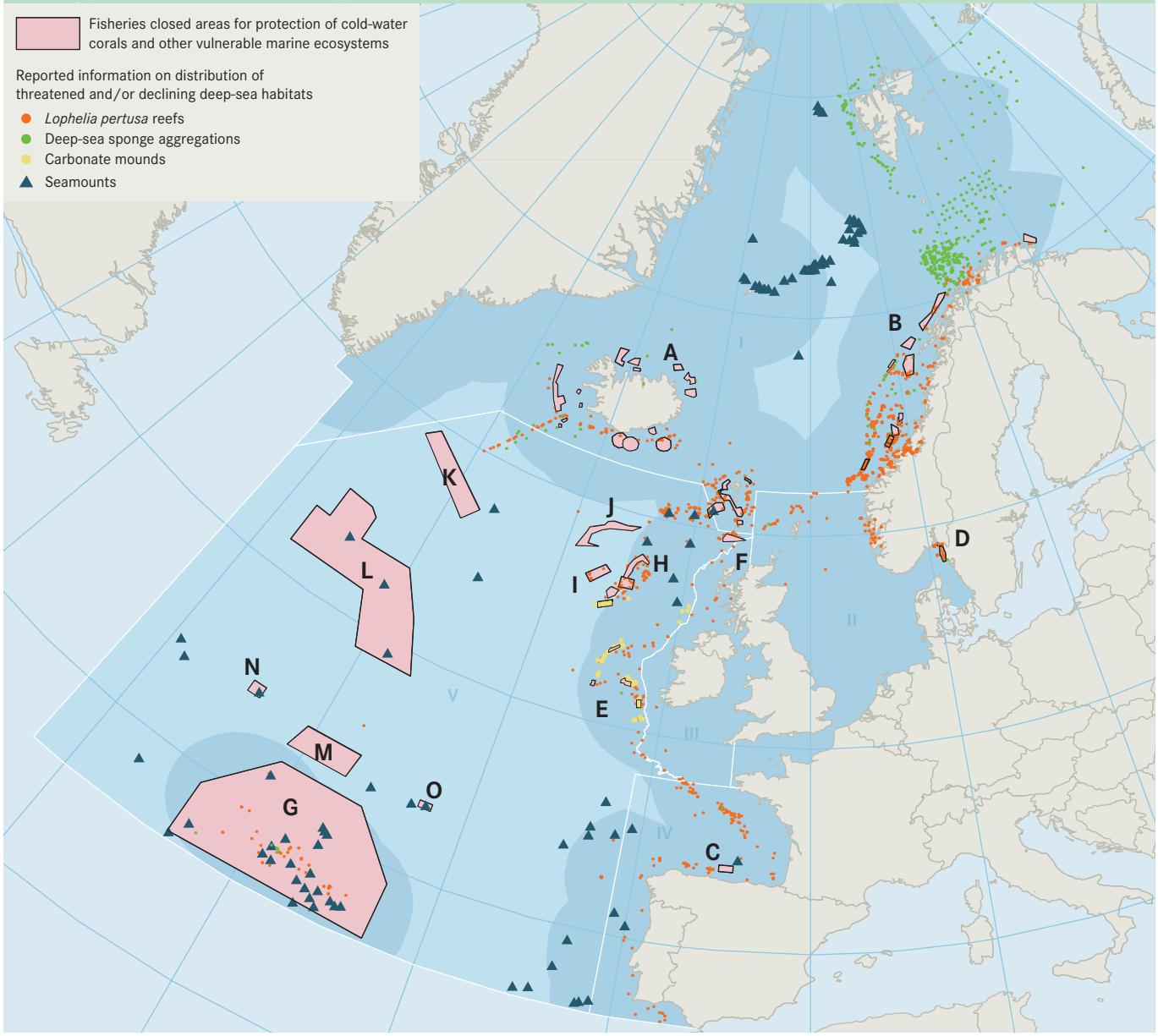


BOX 10.3 Protection of cold-water corals and other deep-sea habitats

Cold-water corals are very important in the deep-sea environment because the habitats they create are biologically rich and diverse. They may either form reefs of hard stony corals (*Lophelia pertusa*) or gardens of soft, non-reef building species. Cold-water coral reefs are widely recognised as threatened marine ecosystems because they are slow-growing habitats that are easily impacted by the mechanical effects of fishing gear. *Lophelia pertusa* has been documented in commercial by-catch in waters off Ireland, Iceland and northern Norway. Survey images reveal the extent of reef impacts including trawl door furrows and broken coral strewn on the seabed.

In 2003, OSPAR Ministers agreed to take immediate measures to protect cold-water coral reefs from further damage by fishing gear. OSPAR raised its concerns about the status of these reefs to the fisheries management authorities of the EU, Iceland and Norway and to the North East Atlantic Fisheries Commission (NEAFC). OSPAR raised particular concerns with NEAFC over the protection of corals on the western slopes of the Rockall Bank.

There has been significant progress in establishing closed areas to fisheries around known reefs, with almost 600 000 km^2 of the OSPAR area currently protected (see map). Protected areas within Icelandic (A), Norwegian (B), Spanish (C) and Swedish (D) waters have been included in the OSPAR MPA network and some fisheries closures have been introduced in Faroese waters. Certain reefs have been jointly designated by EU Member States under the Habitats Directive and the OSPAR network, including four areas in Irish waters (E) and the Darwin Mounds (F) in UK waters. Initial restrictions on fishing gear in these areas were introduced through provisions under the EU Common Fisheries Policy. This approach has also been used to protect reefs around the Azores (Portugal) (G) and on North-West Rockall Bank (UK) (H). The need to protect deep-sea habitats is one of the issues for cooperation under a memorandum of understanding between OSPAR and NEAFC established in 2008. One of the most significant conservation measures in the OSPAR area is the NEAFC temporary closure of an area comprising 330 000 km^2 to bottom trawling for the purpose of protecting vulnerable deep-sea habitats. This includes closure of three areas to the west and south of the Rockall Bank (I), parts of the Hatton Bank (J), three large areas on the Mid-Atlantic Ridge (K,L,M) and two isolated seamounts (N,O). The map below includes known distributions of four threatened deep-sea habitats on the OSPAR List based on the OSPAR habitat-mapping programme (*Lophelia pertusa* reefs, carbonate mounds, deep-sea sponge aggregations and seamounts). Knowledge of the distribution of cold-water coral reefs and other deep-sea habitats is still growing. In 2008, OSPAR recognised coral gardens, a further cold-water coral habitat, as being under threat and is now working to raise awareness of this habitat.



Littoral chalk communities

Intertidal mussel bed

Many of the species and habitats on the OSPAR List are affected by poor environmental quality. Work towards improved environmental quality under all OSPAR Strategies has had a positive influence on biodiversity. For example, threatened and/or declining species and habitats as well as wider ecosystems benefit from improvements in water quality. Dogwhelk populations, which were heavily affected by the use of tributyltin (TBT) as an anti-foulant in marine paints, are no longer declining and are re-colonising some sites from which they had previously disappeared → **CHAPTER 5**. Before the global ban on the use of TBT under the International Maritime Organization, some of the first international action on TBT was taken by OSPAR. The extent of further impacts of hazardous substances on sensitive marine species, including effects such as endocrine disruption, is still being revealed.

Implementing measures can be challenging

In the Azores, a number of measures have been introduced to protect the wild Azorean limpet following a dramatic collapse in the late 1980s, including closed seasons, closed areas and licensing of fishermen. The measures have not been effective in protecting the limpet population from illegal exploitation, because the extent of the coastline and its remoteness make enforcement difficult. Legal measures must be maintained for several years and supplemented by awareness raising.

In the Wadden Sea, intense exploitation of intertidal mussel beds removed almost the entire stock of blue mussels between 1988 and 1990. As a result, trilateral targets were adopted by Denmark, Germany and the Netherlands, and a management plan for the blue mussel fishery was laid down in 1997. However, despite considerable efforts in mussel management and the closure of extensive parts of the Wadden Sea to mussel fisheries, the area of intertidal mussel beds is only increasing in parts of the Dutch Wadden Sea. Long-term changes in climatic conditions and increasing numbers of non-indigenous species, such as Pacific oyster, are thought to be a contributory factor to this lack of success.

Azorean limpet

Situation is critical for other species and habitats

Progress on the protection of other species and habitats has been too slow. Many diadromous fish species (those that migrate between freshwater and marine habitats at different stages of their life-cycle) have been strongly declining. Five such species have been identified by OSPAR as under threat and in decline (European sturgeon, Allis shad, houting, sea lamprey and Atlantic salmon). The decline is attributed to direct impacts, such as uncontrolled commercial and recreational fisheries, and indirect impacts, such as degradation of spawning habitat, decreased water quality, impacts from aquaculture and barriers to migration. The European sturgeon is recognised as critically endangered by the International Union for Conservation of Nature (IUCN) → **BOX 10.4**. Stocks of the Atlantic salmon continue to be at low historical levels in spite of management measures aimed at reducing exploitation, mainly due to poor survival at sea. Efforts continue to fully understand the reasons for this, although it has been attributed to climate change.

Some commercially exploited fish stocks, particularly cod in Regions II and III, and orange roughy and blue-fin tuna in Region V have undergone a strong decline, mainly due to poor management and overfishing.

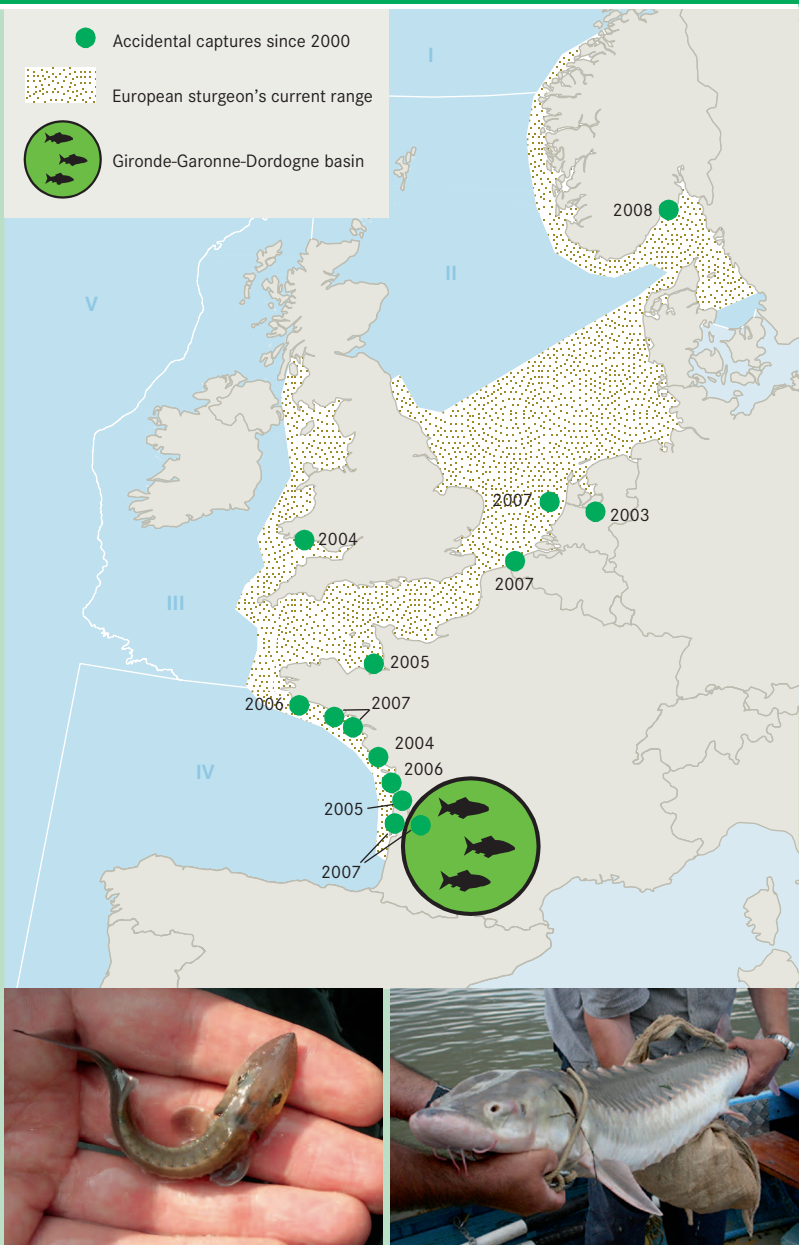
BOX 10.4 Protecting the last population of the European sturgeon

The European sturgeon is the largest freshwater fish in Europe and probably one of the most vulnerable species in OSPAR's waters. Its spawning grounds have dramatically declined since the 19th century and are presently restricted to one area in the Gironde-Garonne-Dordogne basin in France (see map) with one confirmed population, but even this may no longer be viable.

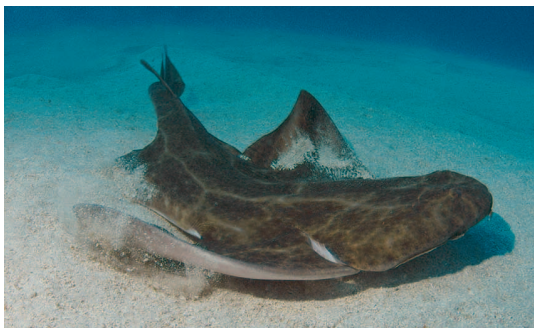
Although the sturgeon breeds in rivers, some adults spend time at sea. Their marine range is entirely confined to the coastal waters of Regions II, III and IV (see map). Loss of natural breeding and feeding habitat, through damming and gravel extraction, appears to have been responsible for the historical decline in sturgeon. The largest current threat to the few individuals remaining is from accidental capture, including as by-catch, and poaching. Water abstraction and pollution also pose problems.

Since its original inclusion in the OSPAR List in 2003, a variety of measures have been introduced in an attempt to reverse its decline. The sturgeon has full legal protection throughout the OSPAR area and awareness-raising campaigns for fishermen and anglers have been undertaken by environmental and fisheries organisations. A Europe-wide action plan for the restoration of this species was drafted under the Bern Convention in 2007.

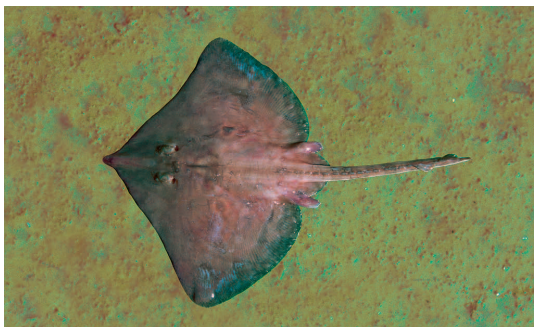
This species has also been the subject of international scientific research and monitoring programmes aimed at understanding the reasons for its decline and at restocking with wild or artificially reared fish. Some 9000 wild fish were released into Europe's rivers in 1995. Over 100 000 reared alevins were released into the Garonne and Dordogne between 2007 and 2009. To date, there has been no evidence of an improvement in its conservation status. In 2008, a programme was started in Germany on experimental restocking of sturgeons in the rivers Oste, Stör and Elbe.



Elasmobranchs (sharks, skates and rays) are long-lived fish found in all European waters. Populations of many elasmobranch species have declined as a result of fishing pressure and in the past several species were targeted by fisheries until their numbers collapsed. An example is the common skate which, as the name implies, was historically one of the most abundant skates in the North-East Atlantic and was widely distributed in the seas off North-West Europe. It is now considered severely depleted in many areas and is no longer found in large parts of Region II (the North Sea) and Region III (Irish Sea). Several other pelagic and demersal shark, skate and ray species occurring in both deep-sea and shelf sea ecosystems are included on the OSPAR List and continuing declines in populations have been reported during the period 1998–2008. Some, such as the angel shark and the white skate, are considered severely depleted. By-catch in commercial fisheries is the main current threat affecting elasmobranchs.



Angel shark



Common skate

Sea-pen and burrowing megafauna community

The Balearic shearwater breeds in the Balearic Islands in the Mediterranean and occurs in Regions II, III, IV and V during summer (particularly June to October). Several breeding colonies have disappeared over the past few decades; threats in their offshore foraging areas in the Atlantic are also likely to have a significant effect on overall populations. The Balearic shearwater is increasingly threatened through overexploitation of its main prey species and changes in their distribution, with by-catch and oil pollution incidents also thought to be significant. At sea, censuses in the Mediterranean and the OSPAR area have both shown significant and rapid declines. This species has a very high risk of extinction (one study estimated the risk at 50 % within three generations) and is classified as 'critically endangered' by the IUCN.

Other species for which priority actions are required include the black-legged kittiwake → **BOX 10.5**, the leatherback turtle, the ocean quahog and the flat oyster.

Sea-pen and burrowing megafauna communities occur in soft muddy sediment and are very sensitive to seabed disturbance. They are found mainly in the shelf seas and deeper coastal waters of northern Region II and Region III, but also in parts of Regions I and IV. The high natural biodiversity of this habitat makes it very productive for fishing. The protection of this habitat in the North-East Atlantic has received little attention until now, with only limited protection provided through existing MPAs.

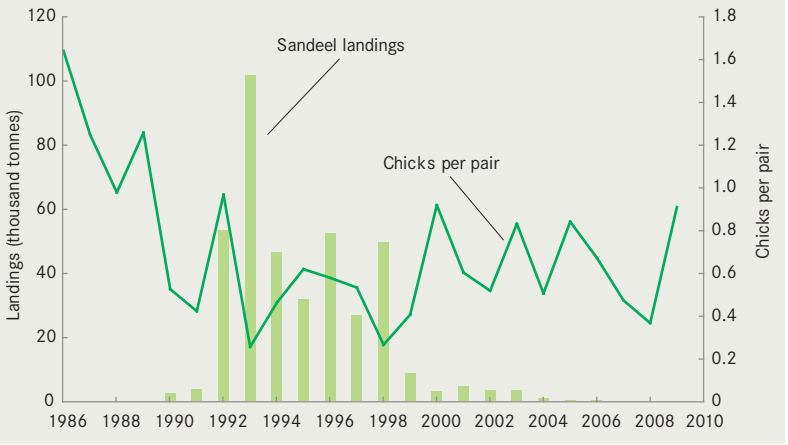
Other habitats for which priority actions are required include intertidal mudflats, *Zostera* beds, *Modiolus modiolus* beds, natural beds of oysters (*Ostrea edulis*), deep-sea sponge aggregations and seamounts.

BOX 10.5 Local sandeel availability to black-legged kittiwakes

Populations of several seabird species have declined in Region I and the northern part of Region II. More than 90 % of the North Sea's black-legged kittiwakes breed on UK coasts. Populations have declined by over 50 % since 1990, coinciding with a period of significant oceanographic change and increased commercial landings of the bird's main prey, lesser sandeels. The graph below compares breeding success of black-legged kittiwake along the east coast of Scotland between Troup Head and St. Abbs, and sandeel catch from the adjacent sea areas east of the Scottish coast (west of 1° W; south of 58° N). This apparent relationship contributed to the decision to close the sandeel fishery off the east of Scotland in 2000. It has remained closed since, apart from a small exploratory fishery.

Breeding success and adult survival for black-legged kittiwakes was also negatively correlated with winter sea temperature. This may relate to rises in sea surface temperatures in the 1980s reducing sandeel recruitment. If temperatures in the North Sea increase further, this may lead to population declines, even if the commercial sandeel fishery remains closed. OSPAR has paused work with ICES on the development of an EcoQO for local sandeel availability to black-legged kittiwakes due to the difficulties of establishing a clear linking mechanism with the catch in the sandeel fishery.

Although an improvement in breeding success was observed on the Isle of May (off the east coast of Scotland) from 2000 onwards, numbers of Arctic skuas, Arctic terns and black-legged kittiwakes in Shetland have continued to decline following poor breeding success between 2001 and 2004. It has been predicted that if sea temperatures in the North Sea increase in the future and the sandeel fishery resumes, the kittiwake population on the Isle of May and perhaps other nearby colonies would enter a 'catastrophic decline'.



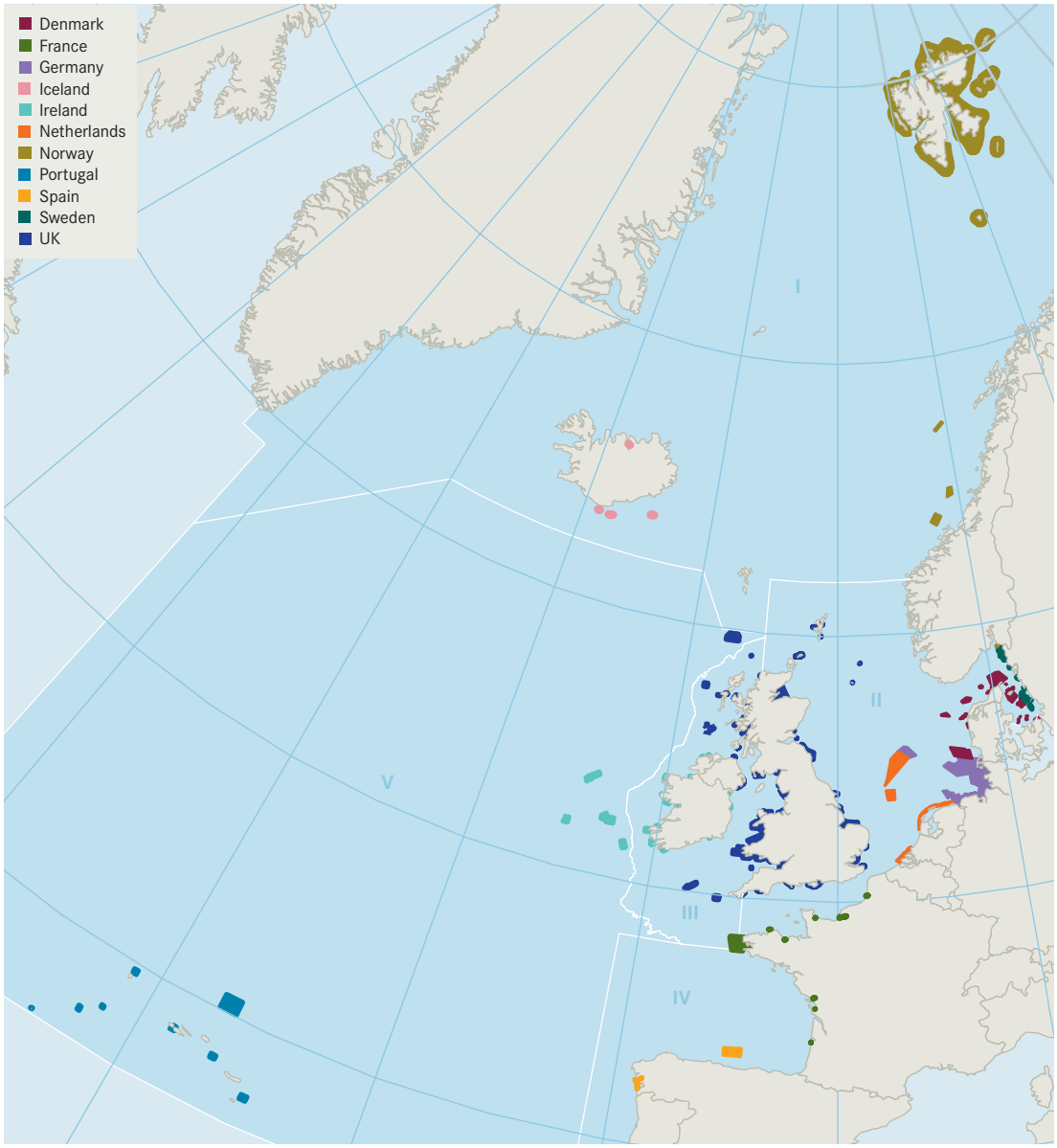


FIGURE 10.2 *The OSPAR network of marine protected areas (January 2010).*

OSPAR MPA network is developing from the Arctic to the Azores

By January 2010, the MPA network comprised 159 MPAs that together covered 147 324 km^2 or 1.08 % of the OSPAR area → **TABLE 10.4** and → **FIGURE 10.2.**

Most MPAs are located within territorial waters, covering a substantial proportion of coastal waters (~13%), while 46 are located at least partly within Exclusive Economic Zones (EEZ) (covering 0.52 %). Only one MPA is located on an extended continental shelf, which is claimed by Portugal. No MPA has yet been established entirely in areas beyond national jurisdiction.

The MPAs included in the OSPAR network offer protection for all invertebrates considered threatened and/or declining, three of the nine bird species listed, eight of the 22 fish species, both turtle species, three of the four mammal species, and all of the habitats listed. This is expected to improve as more MPAs are designated and management plans are developed and implemented → **FIGURE 10.3.**

TABLE 10.4 *Marine protected areas nominated to OSPAR (January 2010).*

OSPAR country	MPAs	Coverage, km²
Belgium	0	0
Denmark	24	8 403
France	9	3 598
Germany	6	16 889
Iceland	7	79
Ireland	19	4 137
Netherlands	5	8 316
Norway	8	80 598
Portugal	8	5 700
Spain	2	2 483
Sweden	8	1 257
UK	63	15 864
Total	159	147 324

Zostera bed

Maerl bed

In Regions II and III, a substantial coverage of MPAs has been achieved in nearshore waters around the UK and Ireland and along the North Sea coast of Sweden, Denmark, Germany and the Netherlands. These protect a diverse range of coastal ecosystems, including tidal inlets and rivers, fjords, estuaries, salt marshes, sandbanks and rocky shores. Extensive areas of intertidal mudflats are included, with the Wadden Sea the most prominent example, together with seagrass beds (*Zostera* sp.), maerl, flat oyster beds, or intertidal mussel beds. The sites also host a number of species under threat and/or in decline, including harbour porpoise, common skate, salmon, cod, sea lamprey, dogwhelk, ocean quahog, and a variety of seabirds such as the Balearic shearwater or black-legged kittiwake. Some MPAs are dedicated to protecting cold-water coral reefs, for example in the Skagerrak. MPAs have also been established in offshore waters, specifically protecting reefs and sandbanks (e.g. the Dogger Bank in the central North Sea).

In Region IV, one MPA is located in offshore waters. The site (known as El Cachucho) protects a unique deep-sea ecosystem in the Cantabrian Sea. It is located in the Spanish EEZ and comprises an extensive elevated bank and seamount with a system of channels and canyons, and an inner basin that separates the bank from the continental shelf. Cold-water coral reefs, carbonate mounds, deep-sea sponges, giant squid and deep-water sharks are found at this site. The remaining MPAs in Region IV are situated along the Breton and Galician coastlines including the Mer d'Iroise to the west of Brittany (France). These sites include intertidal mudflats and beds of oysters, mussels and kelp, and rare species such as the leatherback turtle, loggerhead turtle and short-snouted seahorse.

In Region V, MPAs are being used to protect the cold-water reefs on the Darwin mounds off the north-west coast of the UK, a number of carbonate mounds in offshore waters to the west of Ireland and the rich marine ecosystems around the Azores. Three hydrothermal vent fields have been included in the MPA network: Menez Gwen, Lucky Strike and Rainbow → **BOX 10.1**, as part of the recently created Azorean Marine Park. The MPAs also include sea-

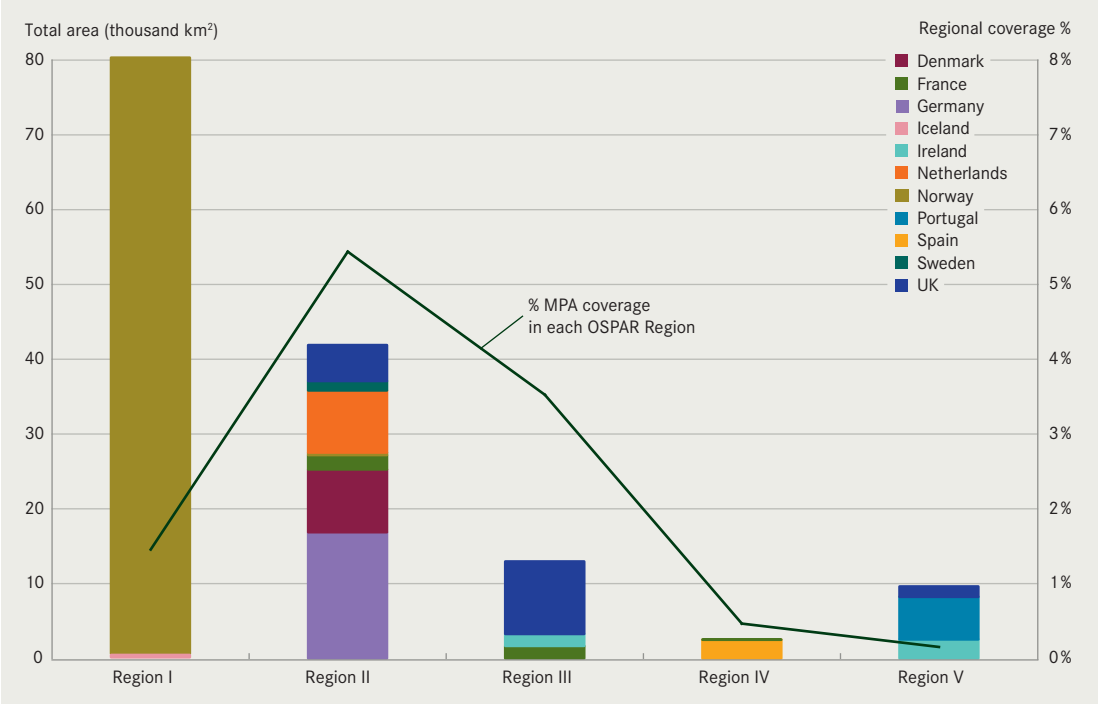


FIGURE 10.3 *Distribution of OSPAR marine protected areas by Region (January 2010).*

Svalbard archipelago

mounts, volcanoes, deep-sea sponge aggregations and cold-water coral reefs, especially of *Lophelia pertusa*. Some of the species listed by OSPAR as threatened and/or declining only occur in Region V, for example, the Azorean barnacle, Azorean limpet and the little shearwater. Other threatened and/or declining species found in these MPAs include the blue whale, loggerhead turtle and orange roughy.

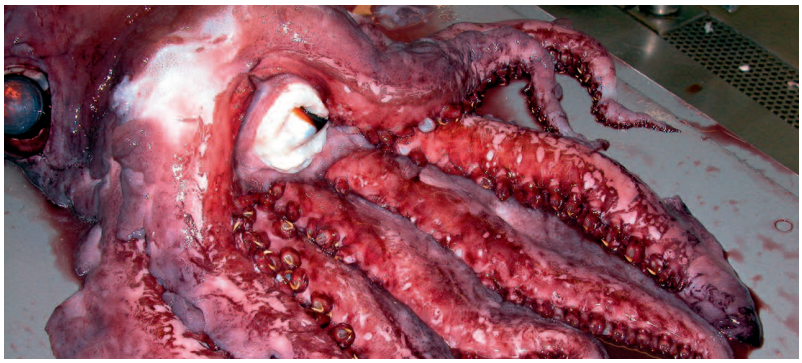
In Region I, MPAs have been established along the coast of Norway, around the Svalbard archipelago and in Icelandic coastal waters. Many protect cold-water coral reef systems, which provide important feeding grounds and shelter for several fish species, including commercially valuable species such as redfish, ling, and tusk. The most common macrofauna in these reef systems are deep-sea sponges, gorgonians, soft corals, squat lobsters, hermit and other crabs, and sea urchins. Around Iceland, two isolated hydrothermal vent fields are protected by MPAs. Three MPAs around Svalbard and Bear Island (Bjørnøya) form the most extensively protected zone in the OSPAR network, covering approximately 78 000 km^2. These MPAs protect a highly biologically diverse and productive ecosystem that is considered to be one of the most important seabird areas in the world.

Ecological coherence of the OSPAR network

A comprehensive assessment of the ecological coherence of the current network of MPAs is hampered by the limited information available on the distribution of many species and habitats within the OSPAR area, including in OSPAR MPAs. A preliminary spatial assessment considering the distribution of OSPAR MPAs suggests that ecological coherence has not been reached across the entire OSPAR area. Within the North Sea, Celtic Seas and the Azores and around the Svalbard archipelago the current MPA coverage provides some degree of connectivity and representativity. It is clear that further sites need to be included in the network to ensure its coherence across the OSPAR area, especially offshore and in the deep seas.

Management status of MPAs

OSPAR is collecting and evaluating information on the management systems applied in the various MPAs. So far, most OSPAR MPAs are also Natura 2000 sites and so management regulations for these sites are based on the requirements of the Birds Directive and the Habitats Directive. However, an increasing number of the sites established as OSPAR MPAs are not Natura 2000 sites. For these a range of management plans, including conservation objectives and related measures, have been established following OSPAR guidelines. OSPAR has also established guidance for the involvement of stakeholders in the designation and management of MPAs, as has been done for the Swedish Koster-Väderöfjord MPA → **BOX 10.6**. Transnational cooperation is also taking place between Sweden and Norway in the development of the marine national parks Kosterhavet and Ytre Hvaler.



Giant squid from El Cachucho (upper); benthic communities of La Mer d'Iroise (lower)

BOX 10.6 Koster-Väderöfjord agreement: an example of stakeholder participation in MPA management

The Koster-Väderöfjord in the Skagerrak is designated as a Natura 2000 site for reefs and sub-littoral sand banks and the northern part is proposed as a marine national park. About 30 fishing vessels operate in the area. Trawling for deep-water shrimp is the most important fishery with annual catches of about 200 tonnes. No other types of trawling are permitted. Historically, demersal fish were the main catch in the area but have suffered a decline.

In 1996, the Swedish Environmental Protection Agency declared its intention to designate the area as an MPA. In response to strong concerns by fishermen regarding possible fisheries closures, the regulator agreed to a study to define the nature conservation values of the area in more detail. As a result, the area was surveyed using remotely operated underwater vehicles (ROVs) and multi-beam scanning bathymetry. The data obtained were studied alongside results from previous sampling programmes.

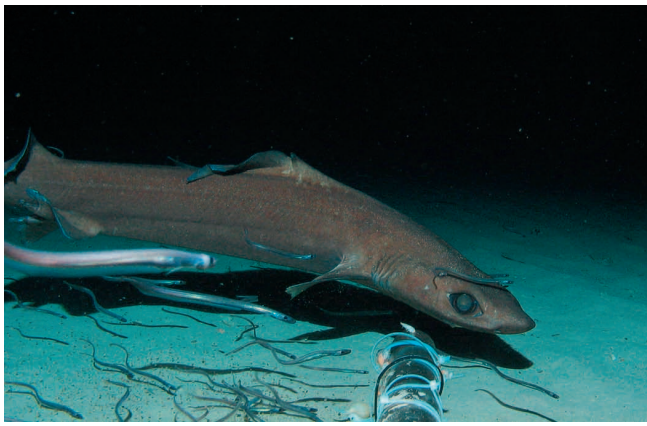
The initial findings proved controversial with local fishermen. In 1999, a working group that included local fishermen, the Swedish board of fisheries and local and regional authorities was set up to manage the potentially destructive shrimp fishery. Among other measures, the group agreed to close 635 hectares to trawling and increased the minimum trawling depth from 50 to 60 m to protect shallow water habitats. Local fishermen agreed to restrict the number of days of fishing per week, as had been done historically in the area. Another initiative by fishermen was to enforce the use of sorting grids in shrimp trawls in order to reduce by-catch.

Protecting areas beyond national jurisdiction

Since 2003, the UN General Assembly has repeatedly called upon states and relevant intergovernmental organisations and bodies to address the conservation and sustainable use of vulnerable marine biological diversity and ecosystems beyond areas of national jurisdiction. With a view to extending the OSPAR MPA network to areas beyond national jurisdiction, OSPAR has been working to identify areas in the deep seas which would merit protection in the form of MPAs → **FIGURE 10.4**. One area being considered, that was initially identified as being beyond national jurisdiction, is an especially complex section of the Mid-Atlantic Ridge between Iceland and the Azores known as the Charlie-Gibbs Fracture Zone. In this area the Mid-Atlantic Ridge rises to many peaks that are shallower than 1500 m and provides benthic fauna with the only hard substrate at these depths in the open North Atlantic Ocean.

The Charlie-Gibbs Fracture Zone opens a major deep-sea connection between the North-West and North-East Atlantic. Within the water column, cold Arctic waters and warm Atlantic waters create a permanent front that forms a major biogeographic divide. The area has several species and habitats under threat and/or in decline, including seamount communities with cold-water corals and deep-sea sponges, seamount-aggregating fish species such as orange roughy and several species of deep-water shark. The main activities in the area are fishing, on some of the seamounts, and shipping. There may be interests for deep-seabed mining. OSPAR has been working with other international bodies towards the protection of this area and significant progress has been made with the closure of the area to bottom fishing activity by the North East Atlantic Fisheries Commission (NEAFC) until 2015. Designating this part of the Mid-Atlantic Ridge as an MPA would be a pioneering step towards adequate protection and good governance of High Seas areas and would provide protection for around 323 900 km^2 or 5 % of Region V.

Deep-sea sponges (left); deep-water leafscale gulper shark (right)



OSPAR has also identified several other ecologically significant areas in the High Seas of Region V, that would merit protection as MPAs: parts of the Reykjanes Ridge, a section of the Mid-Atlantic Ridge north of the Azores, and the seamounts Altair, Antialtair, Josephine and Milne.

Although all these areas were initially identified as being beyond national jurisdiction, some are in part the subject of submissions to the UN Commission on the Limits of the Continental Shelf concerning the definition of the outer limits of the extended continental shelf of coastal states. There are, therefore, important jurisdictional issues that need to be addressed in considering their designation as MPAs.

How does this affect the quality status?

Protecting key features should contribute to the overall quality status

Measures to protect the various species and habitats identified by OSPAR as threatened and/or declining should have a positive benefit for the overall quality status of the marine environment. Although a focus on rare and declining species does not ensure that all key functions of the ecosystem are protected, there will be some benefit to other species, habitats and ecological processes.

In 2009, a re-assessment of the species and habitats listed as threatened and/or declining showed that for most species there had been no change in overall status since their listing in 2003. Some are close to extinction (e.g. Azorean limpet, European sturgeon, Iberian population of the guillemot, northern right whale), many are severely declining (e.g. Balearic shearwater, most diadromous fish species, leatherback turtle), one is now stable but in very low numbers (little shearwater) and one is slightly increasing in numbers (dogwhelk). Stocks of commercially fished species such as bluefin tuna, orange roughy and cod (in parts of the North Sea and Irish Sea) are at a low level. Threats to habitats justifying their inclusion in OSPAR's List continue. Many of the habitats on the list may still be decreasing in extent and even with the implementation of appropriate measures it will be some time before any improvement can be detected, especially where habitats host long-lived species.

Monitoring and assessing ecosystem health

Although OSPAR countries undertake a wide range of biological monitoring programmes, there is a need for improved coordination. These programmes mostly focus on protected sites or features rather than the functional aspects of the ecosystem. In developing the next phase of OSPAR's work it will be important to give more emphasis to monitoring

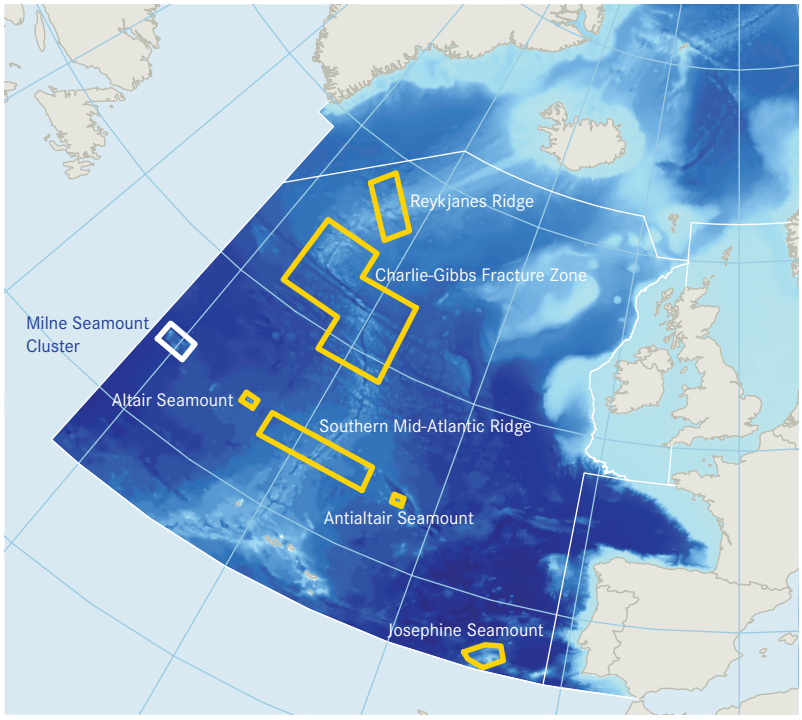


FIGURE 10.4 *Ecologically significant areas being considered by OSPAR for the establishment of marine protected areas in areas beyond national jurisdiction. Areas delimited in yellow were initially identified as being areas beyond national jurisdiction, but are either wholly or partly the subject of submissions to the UN Commission on the Limits of the Continental Shelf concerning the definition of the outer limits of the extended continental shelf of coastal states.*

Little shearwater (upper); leatherback turtle (lower)

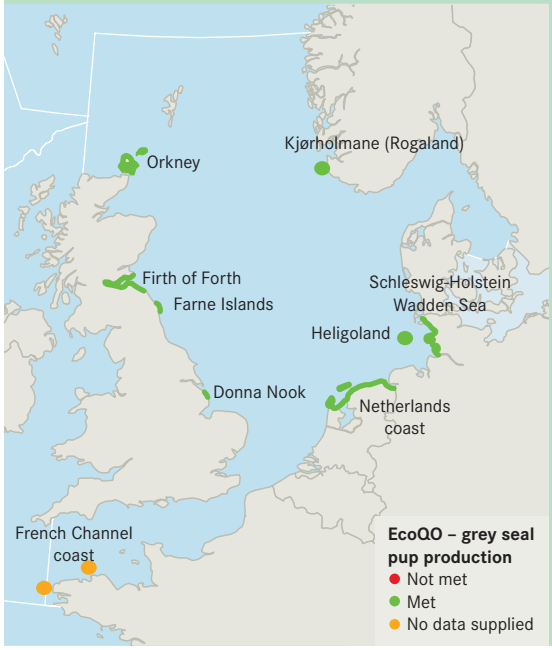
BOX 10.7 Healthy seal populations

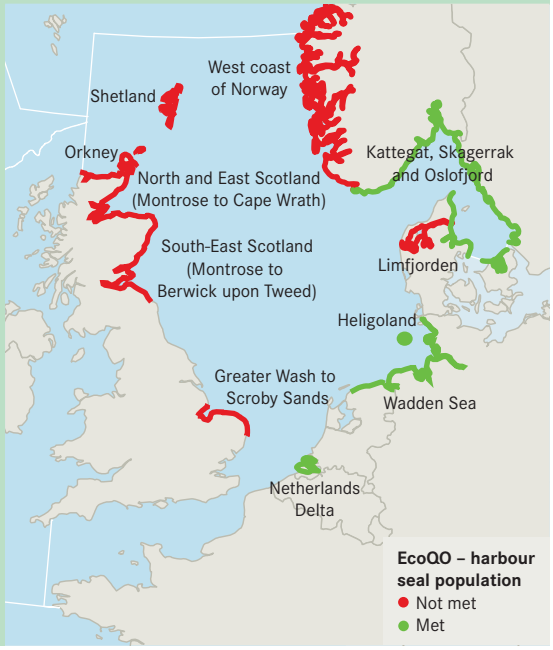
North Sea EcoQO: Taking into account natural population dynamics and trends, there should be no decline in pup production of grey seals or harbour seal population size (as measured by numbers hauled out) of ≥10 % as represented in a five-year running mean or point estimates (separated by up to five years) within any one of a set of defined sub-units of the North Sea.

Of the five species of seal that occur in the OSPAR area, only the grey seal and the harbour seal are common in the North Sea (Region II). Separate EcoQOs have been adopted for grey seals and harbour seals to account for their differing biological characteristics. Harbour seals breed more widely around the coast than grey seals, which have breeding colonies in specific locations. In recent decades, virus infections led to high mortality among seals. OSPAR's EcoQO is to maintain healthy populations of these seal species in the North Sea by triggering management action when needed.

In general, recruitment of grey seal pups in the North Sea increased while the population of harbour seals has decreased over the years up to 2006. Based upon the five years up to 2006 the EcoQO was met for grey seals for all significant units of the North Sea population (see map left). Over the same period, the harbour seal EcoQO was not met in several areas where declines of seals of more than 10 % occurred (Shetland, Orkney, east of Scotland, Greater Wash to Scroby Sands, Limfjorden in Denmark, and West Norway) (see map right). Of these areas only the Limfjorden area has been affected by an outbreak of the morbillovirus in recent years. In other areas, the cause of the decline is unknown. Data from 2008 suggest that more recently harbour seal populations in the Wadden Sea have been increasing.

This EcoQO acts as a general ecological indicator, because seals are top predators and their status depends on a wide range of variables. The failure to meet the EcoQO for harbour seals needs to be investigated. Changes in population size or pup recruitment might indicate wider problems in the ecosystem, such as depletion of food stocks through fisheries, pollutants affecting reproductive ability or changes in distribution associated with climate change. A combination of pressures may cause physiological stress and increase susceptibility to disease. If the decline is found to be the result of human activities, then suitable management measures must be implemented.





Zostera bed

Harbour porpoise

and assessing status and impacts at the ecosystem scale. OSPAR's work on EcoQOs in the North Sea provides a basis for this, for example the EcoQO for healthy seal populations → **BOX 10.7**. Assessing marine ecosystems that contain a mosaic of different habitats and a diverse range of species is still a challenge. A pilot of a matrix approach to ecosystem assessment is reported in Chapter 11. This provides some useful experience but also reveals that there is a long way to go in order to be able to carry out integrated assessments in a scientifically credible manner. The approach also demonstrates the need for improved methods for monitoring and assessing the extent and condition of habitats. Efforts on habitat classification and mapping must be continued and strengthened, to provide better information on the distribution, extent and condition of habitats in future assessments. There is also an important link to the concept of good environmental status under the EU Marine Strategy Framework Directive, which seeks to embrace ecosystem functioning.

Protecting ecosystems beyond MPAs

An ecologically coherent network of well-managed MPAs supports the wider ecosystem. Species and habitats within an MPA depend upon and contribute to processes occurring outside the MPA. These relationships are often more complex and occur over a larger scale than in terrestrial ecosystems and are particularly important for highly mobile species, such as certain seabirds, marine mammals and fish. One of the concepts behind an ecologically coherent network of MPAs is to safeguard areas critical to certain stages of the lifecycle. A network of MPAs can also provide greater ecosystem resilience in response to changing environmental conditions, such as climate change. Monitoring within MPAs needs to be extended to allow evaluation of whether OSPAR MPAs have improved the status of the local or the wider environment.

What happens next?

Reducing the rate of biodiversity loss

On the basis of current evidence, the UN target of reducing the loss of biodiversity by 2010 is far from being achieved in the North-East Atlantic. There is an urgent need for effective protection and conservation of the threatened and/or declining species and habitats on OSPAR's List, which are primarily affected by pressure from fishing, general environmental status and the developing pressures from climate change. OSPAR must ensure that biodiversity protection is fully taken into account in related policies for the management of human activities, such as fisheries policies, in the EU Marine Strategy Framework Directive, and in marine spatial planning. This will require more intensive cooperation with other bodies as well as public outreach and awareness raising. These efforts must also be supported by targeted actions and measures to support the conservation of these features.

Effective monitoring of biodiversity

To support the ecosystem approach, OSPAR must extend its focus beyond protecting individual species and habitats or specific sites. Given the array of different actors managing the pressures that impact upon biodiversity and ecosystems, OSPAR should prioritise the development of an effective scheme for monitoring and assessing wider biodiversity status and ecosystem function. This must be linked with the concept of good environmental status under the EU Marine Strategy Framework Directive.

Moving forward with MPAs

The goal of an ecologically coherent network of well-managed MPAs by 2010 will not be met across the entire OSPAR area. Fuller use should be made of the potential of the MPA network to protect species, habitats and ecological processes beyond those covered by Natura 2000 sites, including those on the OSPAR List, and in areas not covered by Natura 2000, especially beyond the coasts and in areas beyond national jurisdiction.

Effective management of the MPA network needs to be ensured, both at the national and international level. This will further support the extent to which the network can move towards the goal of being ecologically coherent. This should be strengthened by integrating MPAs with marine spatial plans, seeking both to protect marine biodiversity and to ensure MPAs can contribute to the wider goals of sustainable management and use of the OSPAR area.

Delivering OSPAR Strategy objectives for biodiversity and ecosystems

→ LEGEND: BACK-COVER FOLD-OUT

OSPAR Region	Status of threatened and/or declining species and habitats	Progress on protective areas (MPAs, fisheries closures etc.)	Key factors and pressures (outlook)	Cumulative outlook for pressures[1]	Action needed
Region I	Many problems * *	Some	Climate Change ↑ Fishing ↓	?	UN, EU, OSPAR, NEAFC and others OSPAR, ICES and others
Region II	Many problems * *	Some	Fishing ↓ Coastal activities ↑	?	UN, EU, OSPAR and others OSPAR, ICES and others
Region III	Many problems * *	Some	Fishing ↓ Coastal activities ↑	?	UN, EU, OSPAR and others OSPAR, ICES and others
Region IV	Many problems * *	Limited	Fishing ↓ Coastal activities ↑	?	UN, EU, OSPAR and others OSPAR, ICES and others
Region V	Many problems *	Some	Fishing ?	?	UN, EU, ICES and others UN, EU, OSPAR, NEAFC and others

[1] *Information is insufficient to judge the cumulative outlook for pressures on biodiversity.*