

European briefings

Marine environment

Seas and oceans act as a coherent ecosystem. Across all of Europe's regional seas, marine biodiversity is in poor condition: only 7% of marine species assessments indicate 'favourable conservation status'. Effects of climate change (e.g. acidification) add to the cumulative impacts.

Effective policy implementation can reduce impacts. For example, for several stocks the number of fish caught at 'maximum sustainable yield' levels continues to increase, suggesting healthier stocks.

Context

European seas include a wide range of marine and coastal ecosystems, ranging from the stable environment of the deep ocean to highly dynamic coastal waters. These ecosystems provide a home for up to 48 000 species.^[1] The range and distribution patterns of these ecosystems vary across regional seas, with the Mediterranean hosting the highest natural biodiversity.

Our growing understanding shows that seas and oceans act as a coherent ecosystem, within which all species and habitats are active and essential components. There is also an enhanced appreciation of the interconnectedness between marine ecosystems and human communities. Humans have been operating with and within marine ecosystems for millennia, causing change through often complex interactions. The consequences of human activities are now so profound that there are negative impacts on the structure and function of marine ecosystems around the globe.^{[2][3][4]} This can have negative consequences for the delivery of ecosystem services upon which human communities depend.^{[5][6][7][8]} At the same time exploitation of the seas continues to grow (EU Blue Growth policy^[9]).

The European Union (EU) Member States are responsible for more than half of the regional seas surrounding the European continent and outermost regions, an area of more than 5 700 000 km². Moreover, 206 million people, or 41% of the EU population, lived in Europe's coastal regions in 2011.^[4] Therefore, the EU has — and is undertaking — the responsibility to face the environmental challenges influencing its seas.

EU environmental policy responses in the marine domain include the Marine Strategy Framework Directive (MSFD), the Common Fisheries Policy (CFP), the 7th Environment Action Programme, the 2020 Biodiversity Strategy, and legislation such as the Birds Directive, Habitats Directive and Water Framework Directive.

The MSFD, as the environmental pillar of the Integrated Maritime Policy (IMP^[9]), is the key component of the EU's policy response to achieve healthy, clean and productive seas. The objective of the MSFD is for European marine waters to achieve 'good environmental status' (GES) by 2020. It aims to promote the sustainable use of the seas and conserve marine ecosystems through the implementation of an ecosystem-based approach to the management of human activities in the marine environment (Box 1).

Box 1: Ecosystem-based management

Ecosystem-based management is an integrated approach to management that considers the entire ecosystem, including humans. The goal is to maintain ecosystems in a healthy, clean, productive and resilient condition, so that they can provide humans with the services and benefits they depend on.

It is a spatial approach that builds around acknowledging connections, cumulative impacts, and multiple objectives. In this way, it differs from traditional approaches that address single concerns e.g. species, sectors or activities.

Source: Modified from McLeod et al., 2009.^[10]

Key trends

There is a scarcity of EU available information on marine biodiversity, as an indicator for patterns of change in the seas. It thus remains difficult to analyse changes in a coherent and consistent manner. However, observations show that many marine species across all European seas continue to experience a decrease in population size as well as a loss of distribution range and habitat due to impacts from human pressures. At the same time, there are also examples of species where the declining trends appear to be halted (see table of [Patterns of change in the seas](#)).

One reason why it is difficult to analyse changes in a consistent manner is that changes often happen in a non-linear fashion as so-called ecological 'tipping points' are crossed (these result in an entire ecosystem shifting into a new state). Such a new state can be characterised by both the altered biodiversity composition and changed resilience of marine ecosystems compared to the previous state,^{[11][12]} and is often less conducive to human development.^[3]

Another reason why it remains difficult to present a European overview is that the information base is often too fragmented to make a coherent assessment. For example, 80% of the species and habitats assessments under the MSFD are categorised as 'unknown' and only 4% have achieved the 2020 target of 'good' status. For the rest: 2% are considered in 'bad' status and 14% were reported as 'other'.^[13]

The same pattern has been observed for the most vulnerable European marine habitats and species, which are protected by the [Habitats Directive](#). From 2007 to 2012, only 9% of the marine habitat assessments were considered to be in 'favourable conservation status', 66% were considered to be in 'bad/inadequate' status, and 25% were categorised as having 'unknown' status. Marine species fared worse, with only 7% of the assessments being favourable. More than 66% were categorised as 'unknown', and 26% were categorised as 'bad/inadequate' in the 2007–2012 period.

For commercially exploited fish stocks, the number of assessed stocks in EU Atlantic and Baltic waters fished above their maximum sustainable yield (MSY), has fallen from 94% in 2007 to 39% in 2013 with a slight increase to 41% in 2014,^[14] and several stocks are considered in good status.^[15] A high number of stocks remain unassessed, in particular in the Mediterranean and Black Seas.^[16] 91% of the assessed stocks in Mediterranean Sea and 5 out of 7 of the assessed stocks in the Black Sea are being fished over MSY.^[14]

Assessments by regional sea conventions, OSPAR and HELCOM, are also finding that marine ecosystems, their biodiversity features, and their related ecosystem services remain under pressure in spite of on-going efforts to reverse current trends (Box 2).

Box 2: Loss of biodiversity in the North East Atlantic Ocean and Baltic Sea

In 2010 OSPAR concluded '...on the basis of the current evidence, that the United Nations' (UN) target of reducing the loss of biodiversity by 2010 is far from being achieved in the North-East Atlantic Ocean'.

For the Baltic Sea, HELCOM concluded in 2010 that 'the status of biodiversity appears to be unsatisfactory in most parts of the Baltic Sea'. HELCOM estimates that 3.9% of the species in the Baltic Sea are threatened and 8.3% are red-listed (out of 2 791 assessed species).

HELCOM also found that out of 24 marine ecosystem services identified in the Baltic Sea, only 10 were operating properly, with 7 being under severe threat.

Source: OSPAR (2010),^[17] HELCOM (2010)^[18], and HELCOM (2013).^[19]

Prospects

The state of European seas is already impacted by historical and current human use resulting in various pressures.^[9] These include the selective extraction of species (i.e. fisheries), seafloor damage, pollution by nutrient enrichment and contaminants, the spreading of non-indigenous species, and climate change.^[20] At the same time, human dependence on marine ecosystems and their services is increasing, and this is taking place without the full understanding of the complex interactions of natural and human-driven changes (Borja, A., 2014).^[21] The patterns of change indicate that Europe has not yet achieved healthy seas (see table of Patterns of change in the seas), and is thus eroding the potential services and benefits such seas could deliver.

Despite this, evidence shows that targeted policy actions and committed management efforts can protect and/or restore species and habitats, and thus help preserve ecosystem integrity. Certain EU marine nature-conservation and fisheries-management efforts are clear examples of positive action.

The marine Natura 2000 network of protected sites, designated under the Habitats and Birds Directives since 1992, accounts for 229 000 km² or 4% of EU marine waters and constitutes a significant achievement. It is supplemented by an additional 109 000 km² of national sites, ensuring that a total of 5.9% of EU waters are within a network of marine protected areas (MPAs). Nevertheless, Europe faces a large challenge if it is to meet the Convention on Biological Diversity Aichi Target 11, which requires 10% of EU waters to be within MPAs or other effective area-based management measures by 2020. This means that in less than 6 years, Europe still needs to designate the same area of MPAs as have been designated under the marine Natura 2000 network over the last 20 years.^[4] Additional efforts are needed to achieve ecologically coherent and effectively managed MPA networks in European seas^[22] as required by the MSFD.

In the Baltic Sea, the status of predators such as grey seals and white-tailed sea eagles has been improving over recent decades.^[18] Moreover, recent monitoring shows that part of the Kattegat (the sea area between Denmark and Sweden) is starting to recover from decades of nutrient enrichment (eutrophication).^[23] In parts of the North-East Atlantic Ocean, encouraging trends are observed for estuarine fish diversity, as well as for the health of seabird colonies in areas under control from invasive species such as rats (Defra, 2010).^[24]

For commercially exploited fish stocks, fishing pressure (i.e. fish mortality levels) has been decreasing since 2007 in EU Atlantic and Baltic waters. Evidence indicates an improvement of the status of several of the fished stocks.^[14] The CFP must overcome various challenges for Europe to reach the goal of fishing at MSY rates for all fish stocks by 2020. This goal will also serve as a contribution to reach the GES objective of the MSFD. These challenges include fleet overcapacity, availability and respect of scientific advice, and an adequate uptake of management measures.

Such examples show that it is possible to manage human impacts on the marine environment and to reverse marine biodiversity loss. While a more coherent information base is needed on issues such as the state of fish stocks and biodiversity features, current knowledge does allow us to move forward.

There is a need to build on the ecosystem-based approach to the management of human activities introduced by the MSFD and other EU policies, such as the CFP, in order to achieve healthy and clean seas. A key challenge will be to steer policy expectations for further exploitation of the seas, such as 'Blue Growth', towards the EU policy objectives of halting the loss of biodiversity and achieving 'good environmental status' by 2020. Overcoming this challenge is needed for Europeans to fully benefit from the services provided by marine ecosystems now and in the future.

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