

Marine protected areas in Europe's seas

An overview and perspectives for the future

ISSN 1977-8449



Marine protected areas in Europe's seas

An overview and perspectives for the future



Cover design: EEA
Cover photo: EUO © OCEANA Carlos Suárez
Right photo: © Alexander Mustard
Left photo: © Metsähallitus, 2006
Layout: EEA/Pia Schmidt

Legal notice

The contents of this publication do not necessarily reflect the official opinions of the European Commission or other institutions of the European Union. Neither the European Environment Agency nor any person or company acting on behalf of the Agency is responsible for the use that may be made of the information contained in this report.

Copyright notice

© European Environment Agency, 2015
Reproduction is authorised provided the source is acknowledged.

More information on the European Union is available on the Internet (<http://europa.eu>).

Luxembourg: Publications Office of the European Union, 2015

ISBN 978-92-9213-692-5
ISSN 1977-8449
doi:10.2800/99473

European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark

Tel.: +45 33 36 71 00
Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

Contents

Acknowledgements	4
1 The EU and marine protected areas	5
Aim, structure and supporting data of this report	5
MPA networks: a key conservation measure for halting biodiversity loss	7
2 Understanding marine protected areas and their networks	8
Why MPAs and MPA networks?.....	8
Towards representative and ecologically coherent MPA networks	9
Assessing and understanding progress of MPAs and MPA networks.....	9
3 EU policy framework for marine protected areas	11
Global policy visions for MPAs	11
EU policy development mirrors global policy.....	11
Key regional and national policy efforts	12
A complex policy framework for designating MPAs is now in place	12
4 Natura 2000: effective implementation developing	14
Geographical coverage of the Natura 2000 network	14
Albeit successful, there is room for improvement	15
5 Regional Sea Conventions to advance understanding of marine protected areas	18
The Baltic Sea — HELCOM	18
The North-east Atlantic Ocean — OSPAR	18
The Mediterranean Sea — Barcelona Convention	20
The Black Sea — Bucharest Convention	20
A solid platform for cooperation.....	20
6 National designations strengthening the network of marine protected areas	21
Designation of national MPAs in the United Kingdom.....	21
Portuguese designations of MPAs	22
7 Does Europe have coherent and well-managed marine protected area networks?	24
Is EU MPA coverage increasing?.....	24
Are EU networks of MPAs ecologically coherent and representative?.....	25
Making MPAs and MPA networks work	26
8 Reflections for the next 20 years of marine protected area designations	29
Towards efficient networks of MPAs in the EU	29
Simple yet complex solutions.....	31
Emerging policies present opportunities	32
References	33
Acronyms and units	35

Acknowledgements

EEA lead author

Johnny Reker.

Additional support and guidance was provided by Ronan Uhel, Eva Royo Gelabert, Carlos Romao and Mette Lund.

European Topic Centre for Inland, Coastal and Marine Waters (ETC/ICM) contributing authors

Aldo Annunziatellis (ISPRA),
Giulia Mo (ISPRA),
Leonardo Tunesi (ISPRA),
Lidija Globevnik (TC Vode)
Luka Snoj (TC Vode),
Sabrina Agnesi (ISPRA),
Samuli Korpinen (SYKE).

Acknowledgements

The support from staff within the European Topic Centre for Inland, Coastal and Marine Waters (ETC/ICM) has been essential for the development of this report. Valuable feedback was received from ETC Biodiversity (ETC/BD), Eionet National Reference Centres for Marine/Maritime, members of the Marine Expert Group established under the Habitats Directive and Marine Strategy Framework Directive as well as staff from DG Environment and DG MARE.

A special thank you goes to Alexander Mustard, Oceana and Metsähallitus for the photos provided for this report.

EEA production

The report was edited by John James O'Doherty and produced by Pia Schmidt and Carsten Iversen.

1 The EU and marine protected areas

- Europe's seas are under pressure. Marine protected areas (MPAs) can act as a key conservation measure to safeguard marine ecosystems and biodiversity as well as the services these ecosystems provide.

Aim, structure and supporting data of this report

This document reports on progress made to date in establishing MPAs and MPA networks in Europe's seas (Table 1.1), specifically MPAs reported by European Union (EU) Member States up to and including 2012. It also discusses how best to assess the effectiveness of these MPAs and determine their effectiveness in protecting biodiversity across Europe's seas. This document supports the European Commission's

progress report on MPAs to the European Parliament and to the Council under Article 21 of Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy — the Marine Strategy Framework Directive (MSFD) (EC, 2008). For this reason, it does not include information on European Environment Agency (EEA) collaborating countries that are not EU Member States. Likewise, it has not been possible to evaluate the relevance of efforts under the Agreement of

Table 1.1 Regional seas surrounding Europe, and selected characteristics of EU MPA networks

Regional seas surrounding Europe	Regional sea surface area (km ²)	EU Member States' share of sea surface area of regional sea (km ²) and (%)	Area covered by MPAs in EU waters within 200 NM (km ²)	% covered by MPAs of EU waters within 200 NM	Total no of sites
Baltic Sea	394 000	370 000 (93.9)	50 105	13.5	3 050
North-east Atlantic Ocean (incl. Icelandic, Norwegian and Barents seas)	7 835 000	4 076 000 (52.0)	171 174	4.2	3 203
Celtic Sea	920 000	916 000 (99.6)	40 457	4.4	1 194
Greater North Sea	670 000	503 000 (75.1)	90 257	17.9	1 534
Bay of Biscay and the Iberian Coast	804 000	804 000 (100)	25 930	3.2	334
Macaronesia	1 853 000	1 853 000 (100)	14 530	0.8	163
Mediterranean Sea	2 517 000	1 210 000 (48.1)	114 461	9.5	1 410
Western Mediterranean Sea	846 000	660 000 (78.0)	103 196	15.6	724
Ionian Sea and Central Mediterranean Sea	773 000	240 000 (31.0)	3 875	1.6	274
Adriatic Sea	140 000	120 000 (87.7)	2 441	2.0	199
Aegean-Levantine Sea	758 000	190 000 (25.1)	4 949	2.6	221
Black Sea	474 000	64 000 (13.5)	2 883	4.5	62
Total	11 311 000	5 720 000 (51.0)	338 623	5.9	7 725

Note: MPA data refer to information reported to the EEA by the end of 2012. Significant additions have been made to the network since, and will be covered in future EEA MPA assessment activities. The analysis presented here is limited to MPAs within 200 NM from the coastline of Member States of the EU and/or equidistant from the coast of non-EU countries. For the Mediterranean Sea, an equidistant approach between countries has been used to delineate the assessment areas, except for Greece, where a 6 NM boundary from the coastline has been used. Sites designated under the Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora; (EU, 1992)) and RSCs exist beyond these boundaries, but these have not been included in the analysis (EEA, 2015b). Bold type is used for MSFD marine regions and normal type for MSFD subregions. The term 'regional seas' is used for both types of regions.

Source: EEA, 2015c.

the Conservation of Cetaceans in the Black Sea, the Mediterranean and Contiguous Atlantic Area (ACCOBAMS), nor in the Emerald Network, the Ramsar sites (i.e. of the Convention on Wetlands of International Importance Especially as Waterfowl Habitat) and the Biosphere Reserves for European MPAs.

The fundamental features of MPAs and the importance of networks of MPAs are discussed in Chapter 2, followed by an introduction, in Chapter 3, to the policy framework used to establish MPAs. Chapter 4 provides an overview of MPAs designated under Natura 2000, while Chapter 5 focuses on another type of MPAs, designated under multilateral international agreements known as the Regional Sea Conventions (RSCs). The subject of Chapter 6 is those MPAs designated by national governments without the need for international agreement. In Chapters 4, 5 and 6, the effectiveness of the MPAs and MPA networks is analysed as far as practical. In Chapter 6, a broader outlook assesses the three different types of MPAs on their conservation of biodiversity and ecosystem services. Chapter 7 brings the report to a close by looking to the future: examining how the next 20 years of EU MPA policy implementation can be informed by lessons learned from the previous 20 years. As such,

the report presents a general view of some of the key MPA drivers in the EU.

Results presented in this report are based on 2012 data reporting by EEA countries to the Common Database on Designated Areas (CDDA) and on 2012 data reporting by EU Member States under the EU nature directives (i.e. the Habitats Directive (EU, 1992) and the Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds; (EU, 2009)). Information is also included from the RSC covering each of the four marine regions in Europe. The methodology for the spatial assessments and detailed results are presented in the 2015 EEA Technical report *Spatial analysis of marine protected area networks in Europe's seas* (EEA, 2015b). It should be noted that there are significant ongoing discussions on MPAs in the RSCs (the Convention for the Protection of the Marine Environment of the North-East Atlantic (named OSPAR because of the original Oslo and Paris Conventions)), and likewise on MPAs in the high seas (in areas beyond national jurisdiction) and the extended continental shelf. Similarly, MPAs are also being designated in the overseas territories of some EU Member States. None of these subjects are considered in this report.

Map 1.1 Europe's regional seas, and fast facts on EU MPA networks

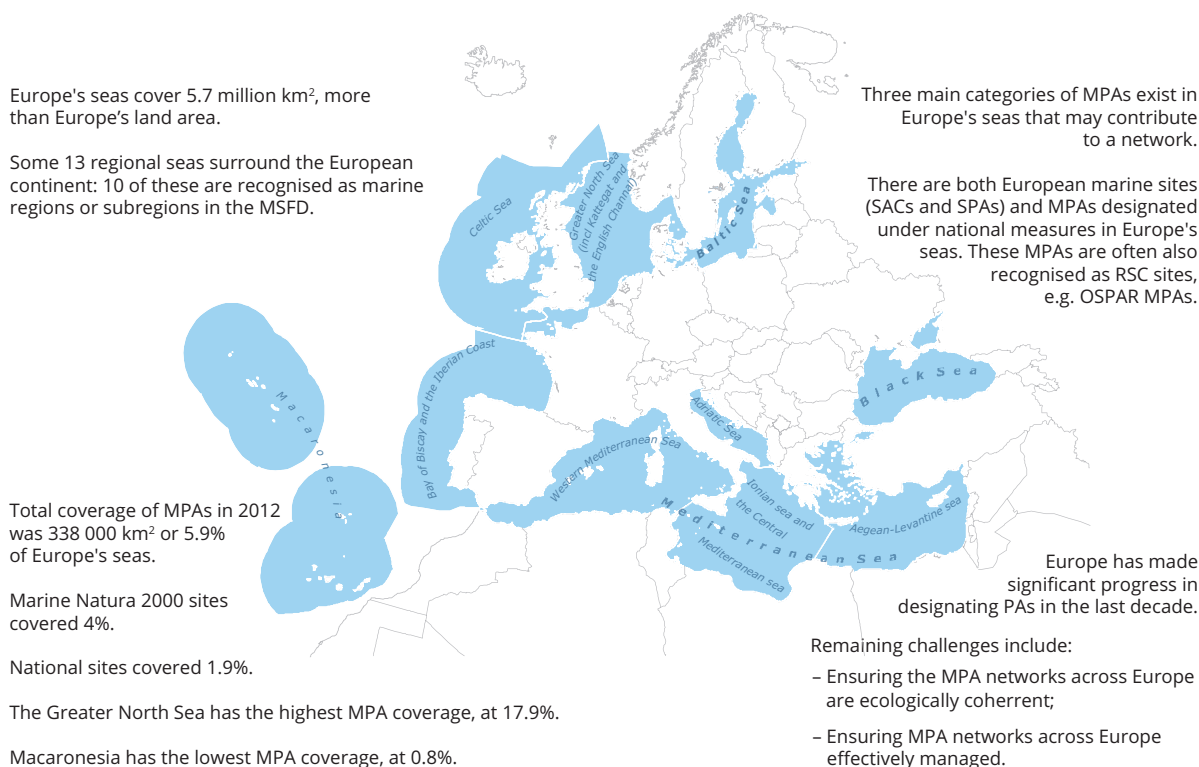




Photo: Group of common dolphins (*Delphinus delphis*). Bajo Somos Llungo ahead Cape Peñas, Asturias, Spain.
EUO © OCEANA, Jesús Renedo

MPA networks: a key conservation measure for halting biodiversity loss

The regional seas surrounding Europe include vast, open oceans as well as almost entirely landlocked seas (Table 1.1; Map 1.1). These seas are home to a diverse range of habitats that sustain thousands of species of plants and animals, a biodiversity which is the foundation for marine ecosystems and their capacity to deliver the services from which we benefit. In addition, more than 5 million Europeans depend on the sea, its ecosystem services and its resources to support their daily livelihood. And millions more rely on the sea for leisure activities such as fishing, swimming and sailing.

In spite of the sea's key role, human activities in the marine environment are jeopardising the state of marine ecosystems. Moreover, land-based activities

are also impacting the sea. Scientists — both globally, and within Europe — have observed an accelerated rate of biodiversity loss through (ecological) extinctions and extirpations of marine species. Biodiversity loss is caused by multiple human activities burdening ecosystems with different pressures: damage and loss of habitats, extraction of resources, introduction of non-indigenous species, pollution and the effects of climatic change. The cumulative effect of these pressures is damaging the state of marine ecosystems (EEA, 2015c).

MPAs are a key policy measure and management tool for addressing these increasingly complex threats to marine ecosystems. MPAs — and networks of MPAs — are a key mechanism to safeguard biodiversity and increase the resilience of ecosystems to unwanted change (see definition in Box 2.1).

2 Understanding marine protected areas and their networks

- MPAs are geographically distinct zones for which conservation objectives are set. MPA networks are a collection of individual MPAs operating cooperatively.
- To adequately report on progress in setting up MPAs, elements such as area coverage, ecological coherence, representativity of the network and management effectiveness are relevant.
- To assess the potential effect of individual MPAs and the measures implemented within them, factors such as age, size, isolation, management and no extraction, are relevant.

Why MPAs and MPA networks?

A range of pressures is now affecting Europe's seas, their biodiversity and the services they provide for human use. These pressures stem directly and indirectly from human activities. Moreover, the prospect for improving this situation in the near future is uncertain at best, given the expected increase of human activities and the systemic nature of pressures and impacts affecting the ecosystem (EEA, 2015c). To address these sustainability issues, an ecosystem-based approach to management (EBM) was introduced in key EU policies and legislation: the Integrated Maritime Policy (based on the communication *An Integrated Maritime Policy for the European Union*; (EC, 2007)), the Common Fisheries Policy (CFP), the 2020 EU Biodiversity Strategy (based on the communication *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*; (EC, 2011)) and the MSFD. EBM works by striking a balance between continuing to manage

the complex relationship between human and natural systems and safely adapting to change (see more on EBM in EEA, 2015c). Our understanding of how human activity affects marine ecosystems and how ecosystems react to such influence is increasing, and investing in ecosystem resilience is a key precautionary management strategy to achieve and maintain healthy seas.

Biodiversity and the interactions between species and their environments are an integrated part of ecosystem resilience. MPAs are tools to safeguard biodiversity in areas vital for the health of the seas. Similarly, the purpose of MPA networks is to ensure that the combined MPA and position are able to effectively counter the systemic impacts on European marine ecosystems and their biodiversity. The network should also ensure that individual MPAs are equally distributed and representative of the marine life hosted in Europe's seas (Box 2.1; Table 3.1).

Box 2.1 MPAs and MPA networks

MPAs are geographically distinct zones for which conservation objectives can be set. They are often established in an attempt to strike a balance between ecological constraints and economic activity, so that the seas may continue to allow for goods and services to be delivered. Marine reserves are MPAs where human impact is kept to a minimum, e.g. extraction is not permitted.

MPA networks are a collection of individual MPAs or reserves operating synergistically, at various spatial scales, and covering a range of protection levels, designed to meet objectives that individual MPAs cannot achieve.

It should be noted that many diverse definitions of MPAs exist.

Source: EEA, 2015c; Smith et al., 2009.

No other management measure has the potential to deliver this sort of biodiversity 'vault' from which we might be able to restore ecosystem structure and functions, if needed. Only MPAs with comprehensive management measures including enforced restrictions against damaging activities, which secure a satisfactory level of protection (e.g. marine reserves), act as such biodiversity 'vaults'. Therefore, MPAs play a unique and crucial part in maintaining an adaptive management response, underpinning other management measures within the broader marine environment. Ultimately, they help us maintain and/or restore ecosystem resilience in our endeavour to attain healthy, clean and sustainable seas. As such, MPAs support the European community's vision of living well within the limits of our planet, as set out in the Seventh Environment Action Programme (7EAP) (EC, 2013b).

Towards representative and ecologically coherent MPA networks

Globally and across Europe, MPA designation is evolving: from protection of individual sites with particular vulnerable or essential features (e.g. rare habitats or vulnerable species), to a more holistic assessment and design of entire MPA networks based on an ecosystem approach. The MSFD anticipates MPA designations which will contribute to achieving coherent and representative networks of MPAs, as part of the programmes of measures to be launched by EU Member States by 2016.

An ecologically coherent network of protected areas must fulfil the following conditions (Noss, 1992):

- represent all distinct natural communities within conservation landscapes and protected area networks;
- maintain ecological and evolutionary processes that create and sustain biodiversity;
- maintain viable populations of species;
- conserve blocks of natural habitats that are large enough to be resilient to large-scale stochastic and

deterministic disturbances, as well as to long-term changes.

These broad goals have since been recognised in a range of international agreements, i.e. by the RSCs (OSPAR, 2006; OSPAR 2013; HELCOM, 2009). In the EU legal context, the MSFD anticipates that coherent MPA networks will be amongst the measures taken to achieve good environmental status (GES) (Box 2.2).

The challenge is to identify what the MPA design principles of '**adequate**', '**coherent**' and '**representative**' mean for Europe's regional seas in practical, scientific, and legal terms, bearing in mind also that these principles are being further refined through ongoing work in the RSCs and through national efforts. Future considerations of network coherence and representativity should include the principles described in Box 2.3. This will facilitate progress in MPA reporting as a management measure to meet environmental targets.

Assessing and understanding progress of MPAs and MPA networks

When evaluating MPA networks, it is important to assess whether the networks meet the objectives they were created to support, i.e. if they contribute to halting biodiversity loss. The following factors could be assessed: 1) area coverage of the network, 2) coherence and representativity of the network, and 3) 'effectiveness' of the MPAs within the network. Recent studies recommend assessing the effectiveness of individual MPAs using factors such as MPA age, MPA size, isolation, enforcement and no extraction (Edgar et al., 2014). Other factors related to management could also be considered (e.g. as identified by the International Union for Conservation of Nature (IUCN)). No standard is currently applied uniformly across Europe's marine regions.

In addition, when evaluating the actual performance of specific measures within individual MPAs in terms of their effect upon marine biodiversity, parameters such as density of species, biomass, size and species

Box 2.2 MSFD, Article 13.4

'Programmes of measures established pursuant to this Article shall include spatial protection measures, contributing to **coherent and representative** networks of marine protected areas, **adequately** covering the diversity of the constituent ecosystems, such as special areas of conservation pursuant to the Habitats Directive, special protection areas pursuant to the Birds Directive, and marine protected areas as agreed by the Community or Member States concerned in the framework of international or regional agreements to which they are parties.'

Box 2.3 Modern MPA network design principles

Representativity: To be representative, an MPA network must protect the range of marine biodiversity found in the seas. This includes protecting those features of conservation importance known to be rare, threatened or declining.

Adequacy: Refers to both the overall size of an MPA network and the proportion of each feature protected within the MPA network.

Viability: For an individual MPA to be viable, it must be able to maintain the integrity of its features (population of species, or condition and extent of the habitat) and to be self-sustaining throughout natural cycles of variation. Viability is determined by the size and shape of individual MPAs in conjunction with their effective management. Viability of the network as a whole should also be considered, as MPAs contribute differently to networks.

Connectivity: Connectivity is the extent to which populations in different parts of a species range are linked by the movement of eggs, larvae or other propagules, juveniles or adults (Palumbi, 2003) but slight differentiation could also be due to sampling error. Examination of genetic isolation by distance, in which close populations are more similar than distant ones, has the potential to increase confidence in the significance of slight genetic differentiation. Simulations of one-dimensional stepping stone populations with particular larval dispersal regimes shows that isolation by distance is most obvious when comparing populations separated by 2–5 times the mean larval dispersal distance. Available data on fish and invertebrates can be calibrated with this simulation approach and suggest mean dispersal distances of 25–150 km. Design of marine reserve systems requires an understanding of larval transport in and out of reserves, whether reserves will be self-seeding, whether they will accumulate recruits from surrounding exploited areas, and whether reserve networks can exchange recruits. Direct measurements of mean larval dispersal are needed to understand connectivity in a reserve system, but such measurements are extremely difficult. Genetic patterns of isolation by distance have the potential to add to direct measurement of larval dispersal distance and can help set the appropriate geographic scales on which marine reserve systems will function well. The MSFD does not define 'network', but dictionary definitions consider 'interconnectedness' to be a key characteristic of the term.

Replication: Replication is protection of the same feature across multiple sites within the MPA network, taking biogeographic variation into account. All features should be replicated, and replicates should be spatially separated.

Protection level: No current European overview exists of the broad range of protection levels: their scope includes reserves and multiple use areas.

Best available science: A vital element of assessing an ecologically coherent MPA network is ensuring that the best available science is used. Uncertainties and knowledge gaps should be recognised and taken into account throughout the process. However, decisions will need to be taken based on this science, and lack of full scientific certainty should not justify postponing proportionate decisions on site selection (Defra, 2010).

Note: Modified from Defra, 2010.

richness could be considered. However, as no coherent information is available on these parameters at EU level, they are not considered extensively in this report. In the EU policy context, the MSFD requires submission of a progress report on protected areas (cf. Article 21) as well as on the contribution made by such networks to achieving and maintaining GES. The Habitats Directive calls for an evaluation of the contribution of the network of Special Areas of Conservation to the conservation status of Annex I Habitats and Species (cf. Article 17 (2)).

It therefore seems fitting that future efforts analyse network distribution and the contribution of MPA management measures to achieve the environmental targets of GES/favourable conservation status. However, until comprehensive databases exist containing details of management measures applied in networks and species/habitat distribution, the assessment may have to rely on partial assessment criteria only.

3 EU policy framework for marine protected areas

- An extensive international and EU policy framework which supports the creation of MPAs in Europe's seas already exists.
- Establishing representative and effectively managed MPA networks has been a main policy objective since 2004, if not before.
- The EU MPA network consists of sites designated mainly under Natura 2000, the RSCs and national legislation.

Global policy visions for MPAs

The year 1992 was in many ways a pivotal time for global biodiversity protection: the UN Convention on Biological Diversity (CBD, 1993) was opened for signature. In the next decade, we appreciably advanced our understanding of marine ecosystems and the drivers of change operating upon them. It also became apparent that existing conservation measures were not producing results fast enough to halt the loss of biodiversity.

In 2004, a measure was specified for the marine environment: representative and effectively managed MPA networks should be put in place by 2012, so as to effectively conserve the world's marine and coastal regions (CBD, 2004). In spite of such policy visions, the global target of 10% by 2012 was not met, and global MPA coverage stood at only 1% in 2010 (Toropova et al., 2010). No European overview exists from 2010, though in the OSPAR region, MPA coverage was 1.08% and in the Baltic Marine Protection Commission (Helsinki Commission or HELCOM) area, 10.3% (OSPAR, 2010; HELCOM, 2010). While MPA coverage has been steadily increasing since 2010, global coverage has not been enough to prevent what the CBD considers a serious decline in global marine and coastal biodiversity and ecosystem services. Recognising this, in 2010 in Nagoya, Japan, 193 CBD contracting parties recommitted to conserve at least 10% of coastal and marine areas through effectively and equitably managed, ecologically representative, and well-connected systems of protected areas, and other effective area-based conservation measures (CBD, 2010).

EU policy development mirrors global policy

In parallel with global processes, in 1992 the EU adopted the Habitats Directive, which aims to protect **vulnerable** natural habitats and wild fauna and flora including those considered rare and/or endemic. Together with the Birds Directive, which has been creating Special Protection Areas (SPAs) since 1979, it remains at the very core of EU nature conservation efforts. A central component of these directives is the use of special conservation areas to help achieve their objectives, through a 'coherent European ecological network' (Natura 2000) covering both land and sea. The Natura 2000 network thus contains Special Areas of Conservation (SACs) designated to implement the Habitats Directive, and SPAs designated to implement the Birds Directive.

At the turn of the millennium, the EU recognised that the loss of biodiversity was continuing, and also that this loss was posing a major threat to long-term sustainable development, both within the EU and beyond. To address this challenge, and reflecting global commitment to the same cause, the EU launched the EU Biodiversity Action Plan in 2006 through the communication *Halting the loss of biodiversity by 2010 — and beyond — Sustaining ecosystem services for human well-being* (EC, 2006), followed by the 2011 EU Biodiversity Strategy (EC, 2011).

Target 1 of the Biodiversity Strategy is to fully implement the Birds and Habitats Directives. This includes the action to complete the Natura 2000 network in the marine environment, further supporting the 2005 European Court of Justice judgement on

implementing Natura 2000 in the EU Member States' Exclusive Economic Zone (EEZ), i.e. beyond 12 NM, up to 200 NM. It also involves ensuring good management by 2012. The marine Natura 2000 network was not complete in 2012, but efforts to designate more sites are ongoing (see the discussion on sufficiency in Chapter 3).

The marine Natura 2000 network has played a key role in improving MPA coverage in the EU's seas (Table 3.1) — it is a major success, considering that it now spans 23 sovereign states. The network covers a specific, limited number of **vulnerable** marine species and habitats, affording these with legal recognition and protection. However, as the knowledge base has grown and the legal interpretation of the directives' applicability has evolved, a limitation has become apparent. Despite providing, in principle, a coherent approach to the protection of seabirds, turtles and marine mammals, the nature directives' approach to the protection of marine fish (e.g. commercially exploited species), invertebrate species (e.g. mussels and sea stars) and marine habitats is less coherent. The directives thus exclude significant aspects of the marine ecosystem from formal protection schemes. This is especially obvious for offshore habitats, e.g. sandbanks below 20 m or soft-bottom habitats, and the associated communities of fauna and flora. This shortfall is apparent, albeit indirectly, from the distribution of the Natura 2000 network (Table 4.1).

In response, the EU produced new legislation: in particular, the MSFD aims to launch measures for achieving or maintaining GES in the marine environment by 2020. One of the measures to be implemented is the use of 'spatial protection measures' contributing to the creation of coherent and representative networks of MPAs, adequately covering the diversity of the constituent ecosystems (Box 3.1). Furthermore, Directive 2014/89/EU establishing a framework for maritime spatial planning is to contribute to the effective management of maritime activities and the sustainable use of marine resources in the marine environment.

Key regional and national policy efforts

Besides global and European visions of establishing coherent networks of MPAs, important work, albeit not legally binding, is also being carried out by the RSCs: HELCOM (Baltic Sea), OSPAR (North-east Atlantic Ocean), the Barcelona Convention (Mediterranean Sea) and the Bucharest Convention (Black Sea). For example, OSPAR was the first regional organisation that protected marine biodiversity in areas beyond national jurisdiction. Likewise, some European states have designated large national MPA networks, either to underpin domestic ambitions or to enforce regional/EU legislation. All of these contribute to the EU network of MPAs.

A complex policy framework for designating MPAs is now in place

Collectively, these diverse instruments have produced a complex policy framework with all components working towards a common goal: the long-term protection and conservation of marine biodiversity in Europe's seas. However, this framework also demonstrates how policies adapt over time as scientific endeavour progresses and practical experience increases — ultimately, it shows how our joint knowledge base expands. Therefore, taking into account the anticipated 'delayed' response of species and habitats, the positive effects of MPAs as a conservation measure are expected to increase in future.

These policy initiatives now share the same challenge. The time has come to ensure that the instruments employed make the vision a reality — halting the loss of biodiversity in Europe's seas, wherever the creation of MPAs can contribute. When reporting progress of a measure that has been evolving over recent decades, it is to be expected that not all aspects develop at the same rate. The following chapters provide information and reflections on the subject, which can further support the EU's endeavours to have its MPAs and MPA networks reach their full potential.

Box 3.1 Spatial protection measures

Spatial protection/area-based measures are the spatial restriction or management of all or certain human activities in order to achieve the following.

1. Protect biodiversity, e.g. marine reserves. Such areas could support MPA networks in terms of coherence and representativity (Article 13.4), and help attain MSFD GES overall.
2. Support certain industrial or leisure activities (e.g. banning of fisheries or gravel extraction within a shipping lane or offshore wind farm), which may have synergistic effects on biodiversity protection/conservation and do not harm the environment.

Source: EC, 2014.

Table 3.1 Selected policy objectives supporting the creation of MPA networks in Europe's seas

Overarching objective	Sources for target	MPA target	What is happening
United Nations			
Halt the loss of biodiversity	Convention on Biological Diversity, 1992, 2002 and 2004	Representative and effectively managed MPA networks should be put in place by 2012, so as to effectively conserve 10% of each of the world's marine regions.	In 2013, 5.9% of Europe's seas were designated as an MPA. No overview exists determining whether the EU MPA network is representative or well managed.
Halt the loss of biodiversity	Convention on Biological Diversity, Strategic plan 2011–2020	Aichi Target 11: By 2020, at least 17% of terrestrial and inland water areas and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.	In 2013, 5.9% of Europe's seas were designated as an MPA. No overview exists determining whether the EU MPA network is representative or well managed. A significant number of sites have been designated since by individual EU Member States. Europe is thus continuously moving towards the target. No overview exists of 'area-based conservation measures'.
EU policies and directives			
Fully implement the Birds and Habitats Directives	EU Biodiversity Strategy to 2020, 2011	Complete the establishment of the Natura 2000 network and ensure good management.	The Natura 2000 network continues to expand. No overview exists determining whether the EU MPA network is well managed.
Ensuring biodiversity through conservation of habitats and species	Habitats Directive, 1992; Birds Directive, 1979	Set up a coherent, ecological network of special areas under the title Natura 2000.	The Natura 2000 network continues to expand. After 22 years of implementation some countries are still not considered, 'sufficient' in their designations.
Achieve or maintain GES	Marine Strategy Framework Directive, 2008	To include spatial protection measures contributing to coherent and representative networks of MPAs, adequately covering constituent ecosystems.	Programmes of measures are being put in place, and should be launched by 2016.
Regional Sea Conventions			
Set up an MPA network consistent with the CBD target for effectively conserved marine and coastal ecological regions	OSPAR Recommendation 2003/3	1) by 2012, to ensure an ecologically coherent, representative network of MPAs incl. the High Seas; 2) by 2016, to ensure the network is well managed and that the appropriate measures are set up and are being implemented.	OSPAR noted in 2012 that firm conclusions concerning ecological coherence are not possible due to the unavailability of sufficient relevant distribution data of species and habitats. Based on the spatial distribution of the MPA network, it cannot yet be considered to be coherent. OSPAR attained cover of 10.39% in 2012 (OSPAR, 2012).
To step up efforts to create an ecologically coherent and effectively managed network of coastal and marine BSPAs	HELCOM recommendation 15/5, 1994; HELCOM Recommendation 35/1, 2014	To reach the target set by the HELCOM 2010 Moscow Ministerial Declaration, that at least 10% of the marine area in all sub-basins of the Baltic Sea, including the EEZ areas beyond territorial waters, is covered by MPAs, where scientifically justified.	The Baltic Sea was the first regional sea to meet Aichi Target 11 concerning 10% spatial coverage. More efforts are being made to increase coherence and balance coverage of MPAs between sub-basins. In 2012, cover was at approximately 12% (HELCOM, 2012).
Set up an MPA network that is in line with the targets adopted under the Convention on Biological Diversity (CBD); Development of a managed network of Mediterranean MPAs, including in the high seas, in particular to meet the 10 % coverage target throughout the Mediterranean by 2020	Barcelona Convention, COP17 — Paris Declaration, 2012; Barcelona Convention, COP18, 2013	To set up a comprehensive, well-managed, effective and equitable, ecologically representative and well-connected system of MPAs in the Mediterranean by 2020. A process to declare Special Protected Areas of Mediterranean Interest (SPAMIs) on the open seas is ongoing, and should be also mentioned, together with action plans such as 'Coralligenous & other Calcareous Bio-concretions in the Mediterranean'.	In 2012, 32 SPAMIs were established in the basin. SPAMIs are MPAs that have been already organised by contracting parties. A process to declare SPAMIs on the open seas is ongoing. SPAMIs, together with all other designated protected marine sites, cover approximately 4.6% of the entire Mediterranean Sea (Gabri�el et al., 2012).
Conservation of Black Sea Biodiversity and Habitats — Ecosystem Quality Objective (EcoQO) 2b	Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea, 2009	Consider the necessity of creation of new and/or expansion of existing protected areas. Establish or extend these areas where necessary.	No information available

Note: It should be noted that application of European nature directives in the marine environment only became legally clear in Europe through a 2005 judgement by the European Court of Justice. This clarified the need to implement Natura 2000 in the EU Member States' EEZ, i.e. beyond 12 NM, up to 200 NM. Therefore, the marine insufficiencies of Member States may wholly or partly relate to that time period rather than date from when the directives were first introduced.

4 Natura 2000: effective implementation developing

- The Natura 2000 network is considered a major success, since it spans the marine territory of 23 countries and covers more than 4% of Europe's seas.
- Some elements still need work: more equitable implementation across Europe's seas, increased focus on representativity and coherence, and a stronger evaluation of the effectiveness of management measures in place.

Geographical coverage of the Natura 2000 network

The Natura 2000 network designated under the Birds Directive (SPAs) and the Habitats Directive (SACs) is a cornerstone for MPAs in Europe. The network targets a number of **vulnerable** marine species and habitats (including rare and endemic), affording these with legal recognition and protection. The overarching aim of the Habitats Directive is to ensure that these species and

habitats achieve or maintain 'favourable conservation status' (see Box 4.1).

Since the entry into force of the Habitats Directive in 1992, the Natura 2000 network, had by the end of 2012 been expanded to cover more than 228 000 km² or > 4% of Europe's seas. In the history of MPA networks, it remains remarkable that 23 countries are bound by the same legal obligation to set up and manage a joint network that spans 10 highly diverse, regional seas.

Box 4.1 Habitats Directive and conservation status (Habitats Directive, Article 2)

Conservation status of a natural habitat means the sum of influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions, as well as the long-term survival of its typical species, within the territory referred to in Article 2 of the Habitats Directive.

Conservation status of a species means the sum of influences acting on the species concerned, that may affect the long-term distribution and abundance of its populations, within the territory referred to in Article 2 of the Habitats Directive.

The **conservation status of a natural habitat** will be considered 'favourable' when the following all hold:

- its natural range and areas it covers within that range are stable or increasing;
- the specific structure and functions that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;
- the conservation status of its typical species is favourable.

The **conservation status of a species** will be considered 'favourable' when the following all hold:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

However, at the same time, it is clear that the marine Natura 2000 network is not being used or designated to the same extent across regional seas. In areas such as the Greater North Sea and the Baltic Sea, Natura 2000 coverage reaches almost 18% and 12%, respectively. In other regional seas such as Macaronesia and parts of the Mediterranean Sea, coverage is significantly lower, particularly in the offshore waters (Figure 4.1; Figure 4.2). It is not apparent whether this is because of different distribution patterns or the extent of listed habitats or for other reasons. However, it is clear that the Habitats Directive focuses on coastal habitats; this, together with a lack of knowledge about species and habitats in offshore areas, has so far resulted in a biased distribution of the marine Natura 2000 network. There is better coverage in coastal waters compared to further offshore (Table 4.1).

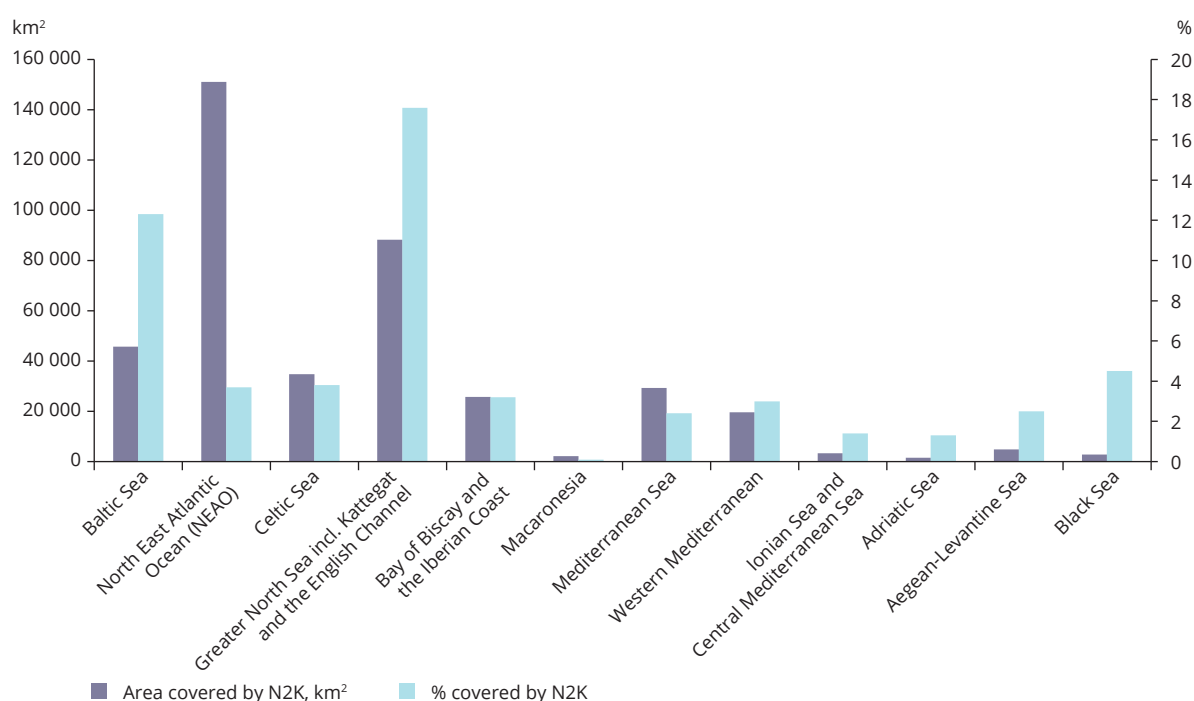
Differences also exist across countries in how large a proportion of their marine territory is covered by Natura 2000 sites (Figure 4.2). It is important to bear in mind that the distribution of Natura 2000 habitats and species, as well as the size of the marine areas, varies across countries, meaning that the effort required by individual countries for designating and managing the sites also varies. Some countries also have significant numbers of additional MPAs supplementing the Natura 2000 sites. As such, the Natura 2000 network is applied differently

across countries. However, it remains the largest single contributor of MPAs in terms of area coverage in the EU's seas.

Albeit successful, there is room for improvement

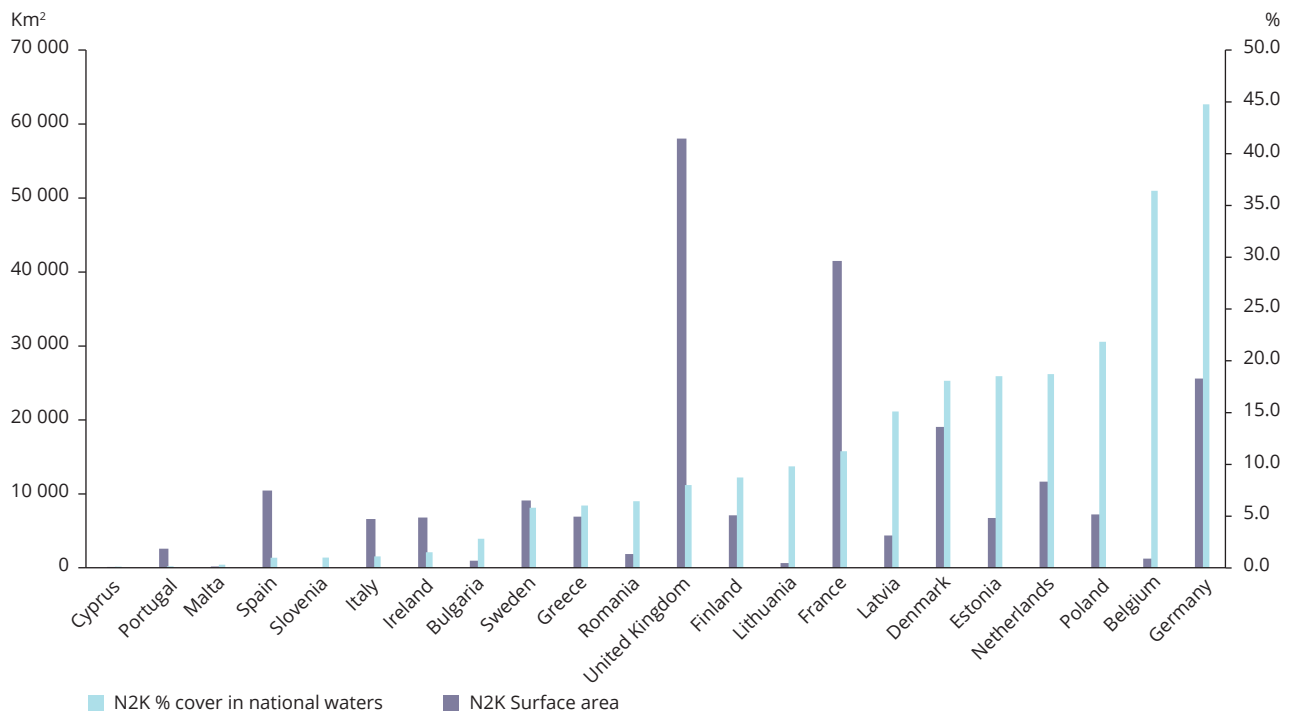
Areas that could be improved include full implementation of the directives, ensuring that future implementation better reflects an increased (eco)systemic knowledge base and achievement of conservation objectives. Since the entry into force of the Habitats Directive in 1992, only 6 of 22 Member States had sufficiently met the Natura 2000 requirements in 2013, in terms of site designations for all relevant marine habitat types; only 4 Member States had met Natura 2000 requirements for all relevant marine species (EC, 2013a). In the period from 2007 to 2012, two regions out of five reported favourable habitat assessments: Macaronesia (33.3 %) and the Black Sea (14.3 %). The North-east Atlantic Ocean (not including Macaronesia) and the Baltic Sea show a particularly high proportion of unfavourable-bad assessments, with 71.4 % and 42.9 %, respectively. The share of unknown assessments is also high (Figure 4.3). To address this situation and to support ongoing efforts, target 1 of the EU Biodiversity Strategy from 2011 is to 'Fully implement the Birds and Habitats Directive' by 2020.

Figure 4.1 Coverage of Natura 2000 network in Europe's regional seas



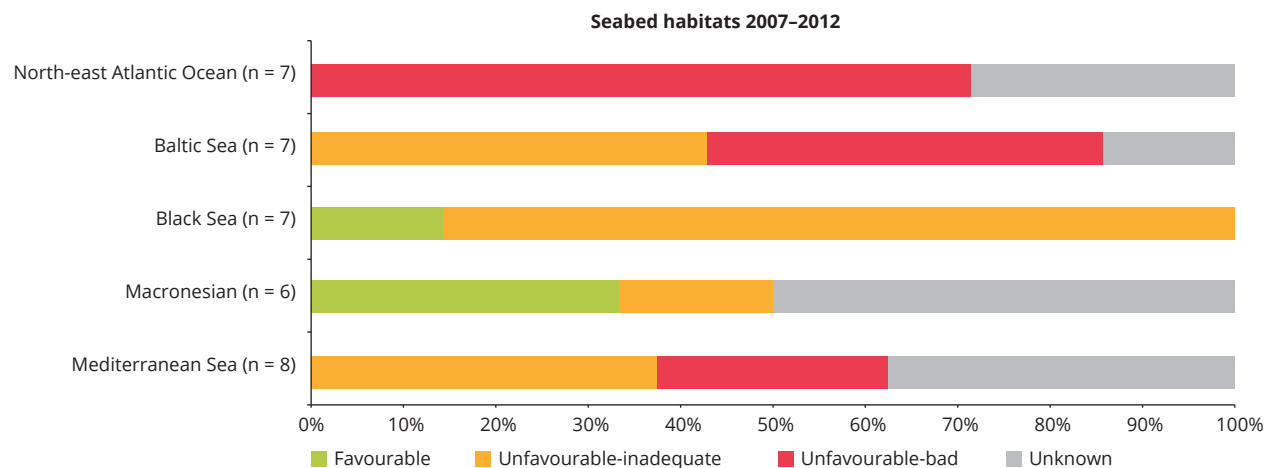
Note: N2K = Natura 2000. The category 'North-east Atlantic Ocean' represents the sum of Natura 2000 coverage for the Greater North Sea, the Celtic Sea, the Bay of Biscay and the Iberian Coast and Macaronesia. The category 'Mediterranean Sea' represents the sum of Natura 2000 coverage of the Western Mediterranean Sea, the Ionian and Central Mediterranean Sea, the Adriatic Sea and the Aegean-Levantine Sea.

Figure 4.2 Coverage of Natura 2000 sites in 2012 per EU Member State (km² and % coverage of the EEZ), ranked according to % coverage of the EEZ



Note: There is not a one-to-one relationship between the MPA cover presented per regional sea compared to per EU Member State. The reason is that some overlaps and/or gaps exist between the waters of individual Member States, which either result in double counting of specific areas or in some areas not being counted at all. The numbers presented for each regional sea represent a seamless, coherent approach for presenting regional and European overviews. This figure has been drawn up for comparison of national efforts.

Figure 4.3 Proportion of habitat assessments in each conservation status class per marine region (2007–2012); assessed habitats are listed under Annex II of the Habitats Directive



Notes: The number of assessments is indicated in parentheses. The total number of assessments is 35. Greece did not provide an Article 17 report.

The Macaronesian marine subregion is separate from the North-east Atlantic Ocean marine region; it is recognised as a separate biogeographic region under the Habitats Directive.

Source: EEA, 2015a.

Table 4.1 Proportion (%) of near shore waters, coastal waters and offshore covered by Natura 2000 sites

MPA assessment area regions	Near shore waters	Coastal waters	Offshore waters
Baltic Sea	30.9	15.3	3.9
North-east Atlantic Ocean	42.9	15.4	2.0
Celtic Sea	31.9	7.8	2.3
Greater North Sea incl. Kattegat and English Channel	59.0	31.5	11.2
Bay of Biscay and the Iberian Coast	47.7	15.6	1.7
Macaronesia	16.3	2.4	< 0.1
Mediterranean Sea	24.5	4.8	< 0.1
Western Mediterranean Sea	45.7	8.5	< 0.1
Ionian Sea and Central Mediterranean Sea	27.0	2.1	0.0
Adriatic Sea	10.1	1.0	0.0
Aegean-Levantine Sea	14.1	2.3	0.0
Black Sea	77.9	19.2	0.0
Total	33.3	11.3	1.7

Note: Near shore = 0–1 NM zone, coastal waters = 1–12 NM zone (for Greece, 1–6 NM), offshore = 12 NM – END, where END = equidistance to neighbouring state or 200 NM.

Source: EEA, 2015. See EEA, 2015 for the delineation of the assessment areas (regional seas). Zones within each assessment area have been chosen to help illustrate the current distribution of the Natura 2000 network and inform future discussions on completeness.

An inherent part of the Habitats and Birds Directives is their focus on **rare** habitats and **vulnerable** species (including those that are rare and/or endemic). As such, the nature directives do not provide a coherent approach towards protecting marine ecosystems and their constituent marine habitats and species. More than 1 000 marine habitats have been described for Europe's seas (Davies et al., 2004; EEA, 2015c). The nine marine habitats listed in the annexes of the Habitats Directive have a coastal distribution overall (e.g. estuaries), and/or a limited extent, (e.g. sea caves and submarine structures made by leaking gases). Even though some of these nine habitats are defined quite broadly, they do not fully represent the diversity of marine habitats found in Europe's seas; in particular, significant (offshore) features of the marine ecosystem outside Natura 2000 protection schemes are omitted.

Although many species are, in principle, covered by the protection recommended for their habitats, relatively few marine species have been listed specifically for protection (excluding birds). More than 36 000 species (excluding bacteria) have been identified for Europe's seas (Costello and Wilson, 2011).

Therefore, with the focus on **vulnerable** species and habitats, Natura 2000 is not, in its current form, set up to deliver an ecologically coherent and representative network of MPAs. With the entry into force of the MSFD in 2008, EU legislation sought to bridge the gap and apply a more holistic approach to networks of MPAs, by introducing modern design principles (e.g. representativeness and adequacy) of an ecologically coherent network (Box 2.3).

The key challenge for the 2020 target will therefore be ensuring that Natura 2000 meets the conservation objectives for which it was designed. This means understanding that all marine species and habitats are interlinked, and that 'favourable conservation status' cannot be achieved without healthy seas in general. It is also necessary to recognise that the dynamics of marine ecosystems, habitats and species can result in a delayed response of individual features to management measures. As such, the next decade will reveal if we are able to merge the new, more holistic understanding of marine ecosystems with the traditional nature conservation approach, to create viable management solutions that encompass both vulnerable species and habitats as well as the broader ecosystem features.

In conclusion, Natura 2000 is considered a success: significant efforts have been made to designate sites across most regional seas, even though the network at sea is not yet complete. Whether the network has improved the conservation status of species and habitats under the Habitats Directive is not visible at European scale, to date. It is unclear whether this is attributable to the incompleteness of the network, the need for more effective management measures/enforcement within the network (providing sufficient protection for species and habitats within each site), the existence of other overriding pressures existing outside the network, or perhaps a combination of all the above factors. However, it is worth remembering that the Natura 2000 network does not stand alone; it is supported by key regional and national efforts, as will be shown in the following chapters.

5 Regional Sea Conventions to advance understanding of marine protected areas

- The four RSCs pertaining to Europe's seas have historically played an essential role in establishing European MPAs and MPA networks.
- Large overlaps exist between Natura 2000 sites and sites designated under the RSC mechanisms, although differences exist across regional seas.
- The RSCs remain a solid platform for developing and implementing an ecosystem-based approach to the designation and management of MPAs.

Europe's seas have historically been perceived as four separate regions: the Baltic Sea, the North-east Atlantic Ocean, the Mediterranean Sea and the Black Sea. Each regional sea is unique in its physical characteristics and ecosystem components, although the challenges they face in terms of pressures and impacts from human activities remain fairly similar. In recognition of the cross-boundary nature of these challenges, the countries sharing each regional sea have set up RSCs to help combat the effects of pollution and other impacts from human activities, and to protect marine biodiversity. This includes the development of MPA networks (Map 5.1).

The Baltic Sea — HELCOM

The RSC in the Baltic Sea is HELCOM, an inter-governmental organisation of nine Baltic coastal countries and the EU, signed in 1974. It was later revised in 1992 to reflect developments in international environmental and maritime law. Its main objective is to protect the marine environment from all sources of pollution.

In 1994, a recommendation was issued on setting up a network of coastal and marine Baltic Sea Protected Areas (BSPAs). By 2013, in just 11 years, MPA coverage in the Baltic Sea had increased from 3.9% to 11.7% (HELCOM, 2015). It was the first of the four regional seas to meet the UN 10% target for MPAs (Table 1.1; Map 7.1). Based upon a comprehensive analysis of the network of MPAs within the Baltic Sea, and despite this very encouraging status of areas covered by MPAs, HELCOM concluded in 2010 that the network could be not considered ecologically coherent for any of the

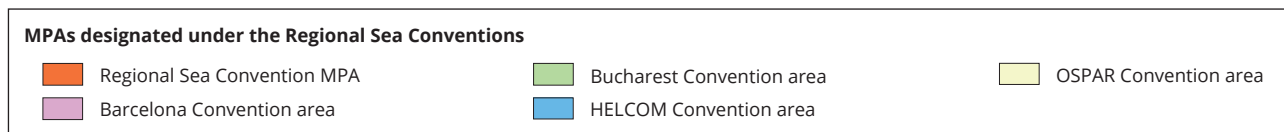
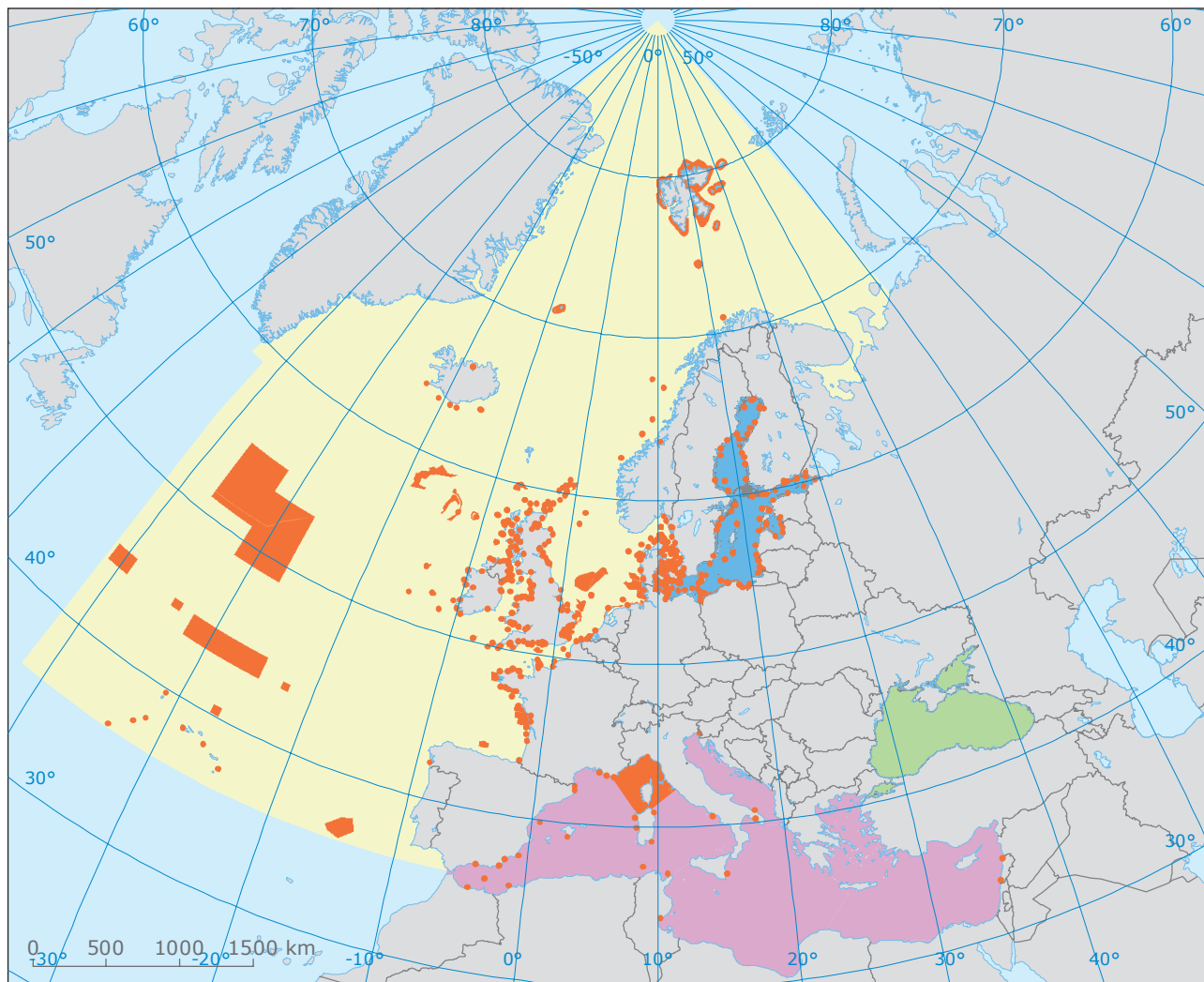
four principles applied in the assessment (HELCOM, 2010). As such, HELCOM has not yet met the quality elements of Aichi Target 11 relating to 'effectively and equitably managed, ecologically representative and well-connected systems'.

The North-east Atlantic Ocean — OSPAR

In the North-east Atlantic Ocean, the RSC is the OSPAR Convention. It covers the Kattegat area, which is also covered by HELCOM. OSPAR is an intergovernmental organisation comprising 15 countries and the EU, who cooperate to protect the marine environment. This includes the non-Atlantic countries Finland, Luxembourg and Switzerland, as their rivers flow into the Atlantic Ocean. The Oslo Convention (i.e. the Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft) was established in 1972; protection was broadened in 1974 to cover land-based sources of pollution and offshore industry (except fisheries) via the Paris Convention (i.e. the Convention for the Prevention of Marine Pollution from Land-Based Sources). In 1992, these two conventions were merged into the Oslo-Paris (OSPAR) Convention, and updated to reflect political and environmental developments. In 1998, this was further extended to include an annex on biodiversity and ecosystems to cover human activities that can adversely affect the sea.

Some areas of the North-east Atlantic Ocean have seen significant progress in designating MPAs. Almost 18% of the Greater North Sea is now within an MPA — the highest amount in any of Europe's seas. OSPAR contracting parties have also designated very large MPAs in the high seas, making OSPAR a global

Map 5.1 MPAs designated under the RSCs



Note: In 2012 and 2014, the United Kingdom nominated Hatton Bank SCI and Hatton-Rockall Basin Nature Conservation MPA respectively to OSPAR. Both sites are entirely located in an area subject to a submission by the United Kingdom to the UN CLCS for an Extended Continental Shelf. The seabed and subsoil of these sites are protected by the United Kingdom, while the water column remains unprotected. OSPAR notes there is a reservation by the Kingdom of Denmark to these sites as the area to which the UK submissions fall is within the proposed outer limits of the Kingdom of Denmark in relation to the Faroe-Rockall Plateau, which is consistent with paragraph 8 of Article 76 of UNCLOS and Article 4 of the Annex II thereto, have been submitted to the UN CLCS, and whose consideration is currently pending.

'front runner' for MPAs in the high seas. The OSPAR Commission has been very active, but individual countries like Portugal and the United Kingdom have also made significant national efforts. However, OSPAR concluded in 2012 that comprehensive conclusions concerning ecological coherence of the OSPAR MPA

network were not possible due to the unavailability of sufficient relevant data on the distribution of species and habitats protected by the MPAs. Based solely on the spatial distribution of OSPAR MPAs, OSPAR concluded that it cannot yet be considered an ecologically coherent network (OSPAR, 2010).

The Mediterranean Sea — Barcelona Convention

In the Mediterranean Sea, the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) set a Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol), which calls upon countries to establish MPAs. This includes the ongoing development of a specific region-wide network of SPAMIs. The SPAMI network is the principal existing regional network acting in EU and non-EU countries. SPAMIs may be set up in marine areas subject to parties' jurisdiction, and in areas situated partly or wholly on the high sea. Special criteria are applied to SPAMIs containing specific Mediterranean habitats of conservation importance and of endangered species.

Other initiatives include the 'Action Plan for the conservation of the coralligenous and other calcareous bio-concretions in the Mediterranean Sea' and the 'Action Plan for the conservation of habitats and species associated with seamounts, underwater caves and canyons, aphotic hard beds and chemo-synthetic phenomena in the Mediterranean Sea' (the Dark Habitats Action Plan).

The Black Sea — Bucharest Convention

The Black Sea spans 6 countries and covers 434 000 km², 55 000 km² of which are under the

jurisdiction of EU Member States. The Convention on the Protection of the Black Sea against Pollution (also known as the Bucharest Convention) aims to preserve representative types of coastal and marine ecosystems, wetlands and other habitats. Its actions include the creation of MPAs.

A solid platform for cooperation

Across the various convention regions, it is clear that in the HELCOM and OSPAR regions, there is an almost one-to-one relationship between RSC MPAs and the Natura 2000 designations (Table 5.1). Convention sites that are not Natura 2000 are almost certainly designated under national laws, as this is typically a prerequisite for international designations (EEA, 2015b), except in the high seas. This implies that in the Baltic Sea and North-east Atlantic Ocean, significant harmonisation is occurring between EU legal obligations/recommendations and actions performed in the context of the RSCs. In the Mediterranean Sea, there is a higher correlation between national designations and RSCs MPAs than with Natura 2000 sites (EEA, 2015b). Regardless of the approach used, it is clear that RSCs provide a solid cooperation platform for the creation of MPA networks spanning entire regional seas, even in the high seas. This will remain an important factor in future, for better managing regional aspects of representativeness, coherence and to ensure effective management measures are put in place across the entire regional network.

Table 5.1 Total surface area, percentage cover of RSC sites in European regional seas and MPA assessment area regions, and overlap with the EU Natura 2000 network

Regional Sea Convention	Regional sea	Area of RSC network in European Seas	Area of RSC network in MPA assessment area	% cover of RSC network in regional sea	% cover of RSC networks in MPA assessment area	RSC network % overlap with Natura 2000 in MPA assessment area
HELCOM	Baltic Sea	52 199	45 826	13.3	12.4	94.3
OSPAR	North-east Atlantic Ocean	219 656	132 204	2.8	3.2	93.9
Barcelona	Mediterranean	90 425	88 602	9.8	9.7	9.9

Note: No data were available for the Black Sea.

Source: EEA, 2015.

6 National designations strengthening the network of marine protected areas

- Harmonisation across policy instruments for MPA designation is ongoing throughout regional seas. The extent to which a country designates a site at national level, EU level or under RSCs ranges between countries.
- Some Member States have recently designated significant additional numbers of MPAs under national legislation, to better ensure representativity and ecological coherence.

Besides designating sites under the nature directives and in the context of the RSCs, most EU Member States recognise that features of regional or national interest need protection, too. For some Member States, these sites are a key element of networks established under the RSCs or form part of the marine Natura 2000 network, while for others, this is not the case. Some MPAs are designated under national, regional and EU protection schemes. In covering 1.9% of EU waters, national sites comprise almost a third of the total coverage of MPAs in EU waters, making the combined coverage of Natura 2000 and national sites 5.9% (Table 6.1). This shows that significant harmonisation or overlap across national and international obligations is already occurring in some Member States. At this stage, it is not possible to determine whether the designation of a site under more than one policy instrument actually increases the protection level of the individual MPAs or their ability to meet the conservation objectives of the site.

This chapter focuses on two recent national initiatives (i.e. since 2012). Although they are not included in the comprehensive analysis presented in EEA (2015a), they serve to illustrate that the combined coverage of our networks of MPAs continues to increase.

Designation of national MPAs in the United Kingdom

Over and above the provisions of the Habitats and Birds Directives, the United Kingdom has introduced domestic legislation which allows for the designation of MPAs, to protect the full range of nationally important marine wildlife, habitats, geology and geomorphology for which MPAs are considered an appropriate conservation mechanism.

The Marine and Coastal Access Act (2009) allows for the creation of Marine Conservation Zones (MCZs) in English and Welsh territorial waters and British offshore waters (UK Government, 2009). The MCZ designation process was initiated with stakeholder-led identification of possible sites via four regional projects that involved, for example, representatives from the commercial fishing sector, marine industry, recreational users and conservation organisations. This process allowed social and economic aspects to be considered in the recommendation of MCZs from the very start of the process. In September 2011, the four regional projects recommended a number of MCZs for designation, based on guidance from the government and their statutory nature conservation advisory bodies, as well as all data available at that time. The guidance included a list of the habitats and species that should be used to identify MCZs, as well as an indication of the number of sites required, and of how large and how far apart they should be. A tranced approach was used to designate MCZs; in November 2013, the first tranche of 27 MCZs was designated in the United Kingdom, 5 of which are in offshore waters. Public consultation has recently closed on a second tranche of a further 23 possible MCZs, pending expected results in January 2016.

In combination, the Marine and Coastal Access Act and the Marine (Scotland) Act (2010) allow Scottish Ministers to designate Nature Conservation MPAs in Scottish offshore and territorial waters respectively, as part of a range of measures to manage and protect Scotland's seas for current and future generations (Scottish Parliament, 2010). The selection of Nature Conservation MPAs in Scotland's seas was a science-led process, albeit underpinned by regular engagement with a range of sea users having an interest in the sites. In July 2014, 30 Nature Conservation MPAs were designated, 13 of which are offshore. Work is progressing on a further four Nature Conservation

Table 6.1 Number of sites and surface area (km²) of national designated sites, and overlap with Natura 2000 and RSC networks

Country	No of sites	Area of national designated sites (km ²)	% overlap between national designated sites and RSC sites	% overlap between national designated sites and Natura 2000
Belgium (BE)	7	5.6	1.0	59.4
Bulgaria (BG)	16	13.8	0.0	59.8
Croatia (HR)	62	666.1	---	---
Cyprus (CY)	1	0.5	0.0	100
Germany (DE)	107	14 794.3	86.7	99.8
Denmark (DK)	270	1 275.6	95.0	97.9
Estonia (EE)	248	6 735.4	88.7	99.9
Greece (EL)	97	3 056.9	0.0	84.1
Spain (ES)	197	5 667.5	52.7	83.1
Finland (FI)	768	3 041.1	60.9	70.1
France (FR)	204	8 955.9	49.6	37.4
Ireland (IE)	8	19.6	0.0	98.3
Italy (IT)	88	26 644.9	94.0	11.1
Lithuania (LT)	6	531.9	41.9	99.0
Latvia (LV)	19	4 381.0	99.6	100
Malta (MT)	87	193.3	0.0	99.2
Netherlands (NL)	30	5 944.3	40.3	97.3
Poland (PL)	4	110.5	99.4	99.9
Portugal (PT)	61	12 561.7	45.0	7.8
Romania (RO)	6	1 424.1	---	99.8
Sweden (SE)	1 178	5 427.7	50.4	75.7
Slovenia (SI)	32	229.9	0.0	3.5
United Kingdom (UK)	1 062	9 898.3	49.0	51.3
Total	4 490	109 489.7	68.2	54.5

MPAs in Scottish territorial waters, predominantly for mobile species where these particular spatial locations are considered to be of critical importance for the life history of the species.

In September 2013, the Marine Act was enacted, making provisions for MCZs to be designated in Northern Irish territorial waters (Northern Ireland Assembly, 2013). Work to identify possible sites is ongoing, but with enactment of the act, Strangford Lough, a former marine nature reserve, has been designated as Northern Ireland's first marine conservation zone.

Across all administration levels, national MPAs in the United Kingdom have been selected to complement the existing 'building blocks' of the MPA network (namely Natura 2000 designations and some existing national measures that protect marine features close to the coast), so that the resulting network protects the range of habitats and species present in British waters for which MPAs are considered appropriate,

helping to create a more representative network of MPAs. Work is now actively progressing across the United Kingdom to best ensure the suite of MPAs is well managed.

Portuguese designations of MPAs

Portugal has a set of MPAs spanning several types of legal status and various degrees of spatial protection. Currently, Portuguese MPAs overall cover a surface area of nearly 134 000 km² in the North-east Atlantic Ocean. This correspond to 3.5% of Portuguese marine waters.

This area will be expanded in the near future via the Portuguese MSFD Programme of Measures (PoM), which aims to meet the CBD 10% coverage target for MPAs. In line with the extension of Natura 2000 to include oceanic areas, the proposed PoM aims to be representative of marine ecosystems under Portuguese jurisdiction. The designation of the new

MPAs covers a wide range of seamount ecosystems, and will add a further 140 000 km² in all to the current network. It will also include 20 000 km² of thematic areas designed for increased cetacean protection. The Portuguese PoM is subject to a public consultation, and so some elements may change before it is finalised. (Direcção-Geral de Recursos Naturais, Segurança e Serviços Marítimos (DGRM), pers. com.)

Neither the British nor the Portuguese sites were reported to the EEA at the time of analysis, and hence this information has not been added to the European statistics presented in this report. The sites will be taken into account in future assessments once they have been officially released.



Photo: Dusky grouper (*Epinephelus marginatus*) in rocky seabed with algae (*Lobophora variegata*, *Styopodium zonale*), and sponges (*Batzella inops*). El Bajón, La Restinga-Mar de las Calmas Marine Reserve, El Hierro, Canary Islands, Spain.

EUO © OCEANA, Carlos Suárez

7 Does Europe have coherent and well-managed marine protected area networks?

- By the end of 2012, EU Member States had designated 5.9% of their seas as MPAs.
- Large differences exist across regional seas in terms of MPA coverage.
- EU MPA networks cannot be considered representative and ecologically coherent.
- Gaps still exist in terms of representativeness, coherence, adequacy and management effectiveness. Only a small proportion of sites appear to be 'no extraction' sites.
- To evaluate the effectiveness of EU MPA networks, information sources need to be better harmonised, science-based evaluation criteria must be developed and agreed, and clear operational objectives must be formulated.
- A clear distinction should be made between MPAs designated with the priority to protect marine biodiversity in general and those created for other purposes i.e. only protecting part of the biodiversity existing inside a site.

This chapter will assess the development of MPAs and networks of MPAs in Europe's seas by reviewing information from previous chapters and applying the following progress assessment criteria: 1) area coverage of the network, 2) coherence and representativity of the network, and 3) 'effectiveness' of the MPAs within the network.

Is EU MPA coverage increasing?

The EU has put a lot of effort into establishing MPA networks since 1992, with considerable success. Networks have been created at national, regional and European level. European countries have even expanded efforts internationally, and agreed to create MPAs in the High Seas. However, the rationale underpinning the designations and their specific objectives is often related to a specific site rather than the network as a whole.

The Natura 2000 network now encompasses more than 228 000 km² or > 4% of Europe's seas. It is distributed across the Baltic Sea, the North-east Atlantic Ocean, the Mediterranean Sea and Black Sea (EEA, 2015). Furthermore, it continues to expand: a substantial number of new sites is being added to the network, e.g. in Spain.

The RSCs are a main driver behind national designations, often going beyond Natura 2000

obligations (as well as being vital for sites in Areas Beyond National Jurisdiction). As such, RSCs remain a solid common platform for coordination and knowledge-sharing. They help keep Europe moving forward towards more representative and coherent networks, as countries learn from each other's experiences.

National networks of MPAs add at least another 1.9%, making the total area within the EU network of MPAs almost 340 000 km², or 5.9% of Europe's seas up to 2012 (Table 1.1). Also, a substantial number of new national sites are being added, including significant numbers from British, Spanish and Portuguese waters. These additional sites will be bringing EU MPA coverage significantly closer to the CBD target of 10% coverage (of MPAs and excluding 'other effective area-based conservation/spatial protection measures'). So far, 3 of 10 regional seas have reached > 10%, solely in terms of the total spatial extent of the networks of MPAs in each region (Table 1.1; Map 7.1). Large differences in MPA coverage still exist across individual Member States.

Some additional areas might be protected by 'other spatial protection measures', but this concept itself needs further development before a joint understanding of its meaning is reached. Likewise, no European database exists to record 'other spatial protection measures'. Therefore it is premature and

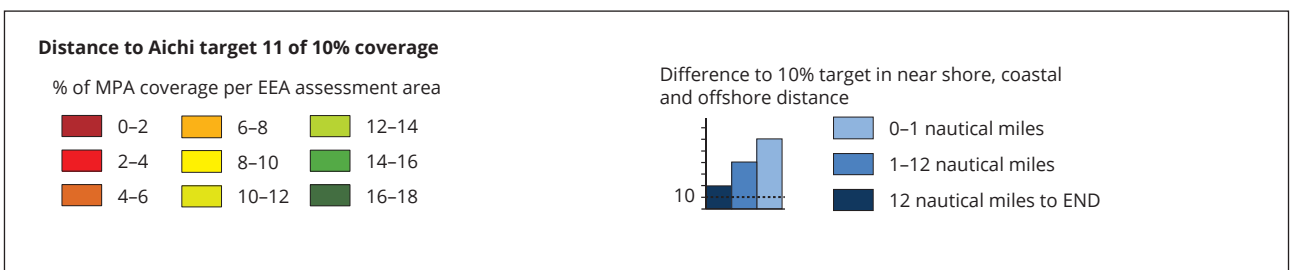
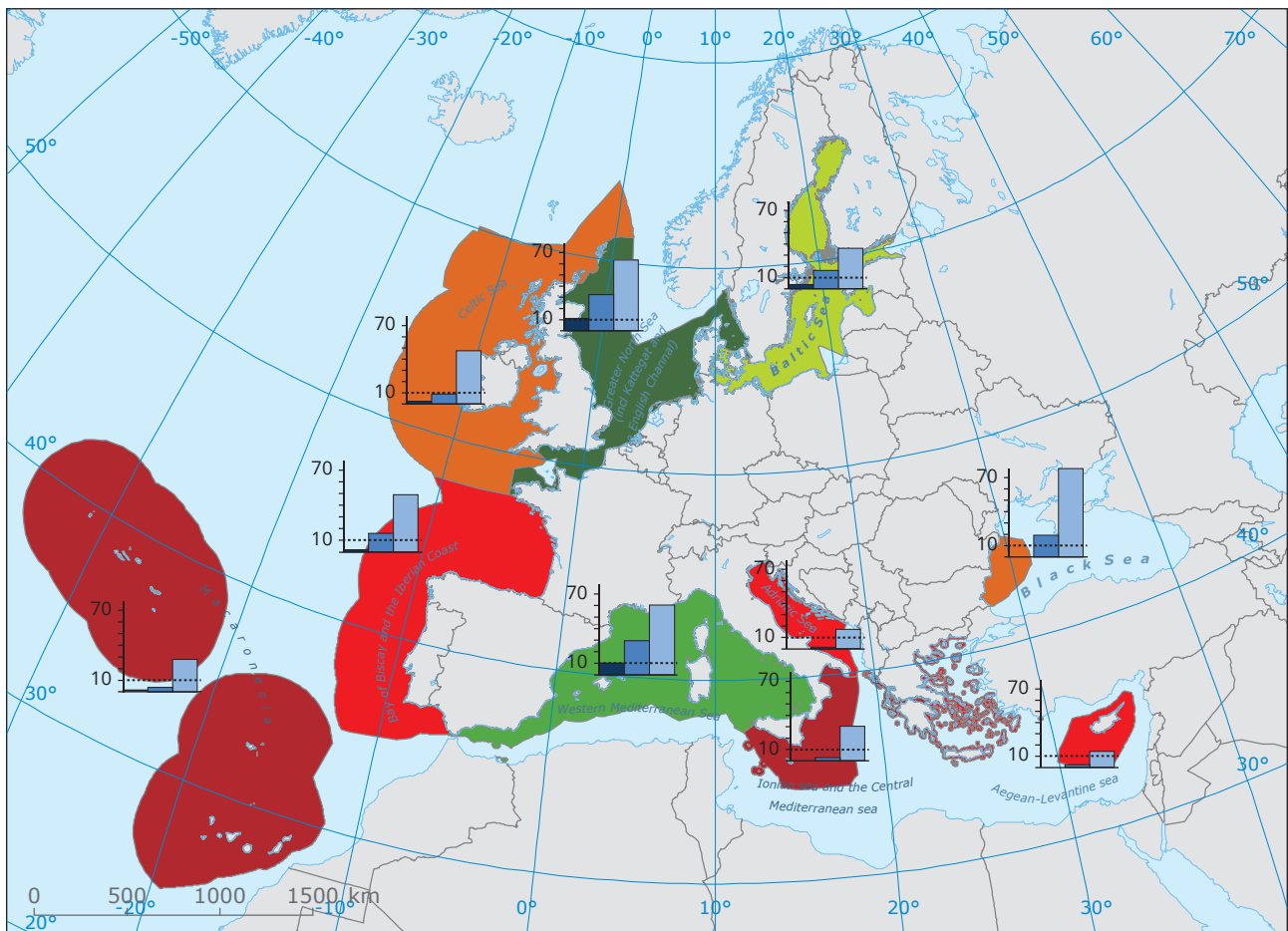
unfeasible to produce an adequate assessment of the elusive 'other spatial protection measures'; these still need to be further developed through EU policy processes.

Are EU networks of MPAs ecologically coherent and representative?

It is clear that the Natura 2000 network is not able to provide a representative and ecologically coherent network of MPAs (Table 4.1; Map 7.1), partly because, when designating Natura 2000 sites, its focus is on

selected vulnerable species and habitats (including those that are rare and/or endemic). It is also apparent that current designations have favoured coastal areas (Table 4.1; Map 7.1). Secondly, the Natura 2000 designation of many EU Member States is still not considered 'sufficient' in terms of the current designations for those habitats and species that are specified in the Birds and Habitats Directives. The Barcelona Convention, OSPAR and HELCOM have all reached similar conclusions concerning representativity and ecological coherence. All consider that their networks of MPAs are not representative, adequate

Map 7.1 Percentage cover of MPA networks in Europe's regional seas, including sites designated under Natura 2000, RSCs and national legislation



or ecologically coherent. No overview exists for the Black Sea.

This raises obvious questions: how to improve the coherence, representativeness and overall effectiveness of our networks of MPAs, in order to better accomplish our policy visions and meet our targets?

Making MPAs and MPA networks work

Part of the answer involves clearly defining 'coherence' and 'representativeness'. Another part requires a better understanding of what actually makes MPAs work, and comparing such knowledge with the current **state of affairs** of EU MPA networks. The RSCs have already undertaken to provide better information on this topic (HELCOM, 2010; OSPAR, 2013; Abdulla et al., 2008). Similarly, looking across the Atlantic Ocean to North America or even globally, others have had useful experiences of making MPAs work (IUCN-WCPA, 2008; Government of Canada, 2011; NOAA, 2015). Combined, these experiences could help inform Europe on how to improve the **management effectiveness** of MPAs and the **ecological coherence** of MPA networks.

In a European setting, a common understanding could include a clear vision and high-level goals framing the EU MPA network envisaged under the MSFD. Moreover, could clear goals and objectives be developed for the intended technical scope of the MPA network required under the MSFD, in order to help managers improve MPA management performance? Thirdly, could this include a classification of MPAs and 'spatial protection measures' clearly distinguishing between those established purely for protecting biodiversity and those established for other purposes? Lastly, relevant operational criteria allowing an objective, consistent evaluation of the effectiveness

of MPAs in protecting biodiversity within the regional seas could be developed, agreed and monitored.

Recent research provides inspiration for what such operational criteria might include (Edgar et al., 2014; Halpern, 2014). This documents that global conservation outcomes of MPAs protecting **reef fish** increased exponentially owing to five key parameters: 1) being no-take, 2) being well enforced, 3) being old (> 10 years), 4) having a certain size (> 100 km²), and 5) level of isolation (by deep water or sand). MPAs meeting only one or two of the conditions of these key parameters were not ecologically distinguishable from areas outside the MPA border i.e. were not effective conservation measures. If between three and five factors were present, the conservation value increased exponentially (Edgar et al., 2014; Halpern, 2014).

It should be stressed that these conclusions were drawn based mainly on results from MPAs focused on conserving shallow reefs and fish populations related to these reefs. However, as seen in the recent LIFE nature project BlueReef, when commercially exploited reef fish species like cod benefit from MPA protection (and restoration measures), a similar response is observed in invertebrates and seaweed on the reefs (Box 7.1). This might indicate that management measures reducing overall pressure can affect the general quality of biodiversity within an MPA.

In order to better inform future discussions on facilitating EU MPAs, a comparison was made with European MPA networks (using currently available information), under the criteria identified by Edgar et al. (2014). It **is not intended** to be prescriptive, all inclusive or to represent a **universal approach for all** MPAs, as the EU MPA information includes many different categories of MPAs.

The comparison stresses that it should be possible to develop operational criteria for assessing the

Box 7.1 BlueReef — an offshore LIFE project

The BlueReef project aimed at restoring an offshore cavernous reef based at the Natura 2000 site Læsø Trindel in the Kattegat area between Sweden and Denmark. Boulder reefs in shallow waters had previously been intensely exploited to construct harbours and sea defences.

Because of the restoration effort (including a fisheries closure), a sixfold-to-eightfold gain in biomass of seaweed and bottom fauna was evident after just 4 years. Fish species such as cod increased on average between threefold and sixfold in the reef area. The BlueReef project budget was worth EUR 4.8 million, and was supported by the LIFE nature fund. It won the LIFE Nature Award 2015 in the category "Best Conservation project".

Source: See <http://naturstyrelsen.dk/naturbeskyttelse/naturprojekter/blue-reef>.



Photo: Seagrass meadows (*Zostera marina*) in the Archipelago Sea National Park, Finland.

© Metsähallitus, 2006

effectiveness of European MPAs, especially those set up to protect biodiversity in general. These criteria could include both spatial standards (e.g. distribution of the network using existing information), and standards related to management measures in places (e.g. existence of management plans). Hopefully, the example will spotlight some of the gaps in our current knowledge, and inform a discussion of what operational criteria for European MPAs might include.

1) No-take (no fishing): It is not possible to quantitatively assess whether EU MPAs are no-take areas or not, as no harmonised, easily accessible data are available. However, in 2012, it was estimated that 74 reserves (no-take) existed in the waters of 16 European countries, covering less than 1 000 km² in total, or less than 0.5% of the area covered by the European MPAs. Of these reserves, 92% cover an area of less than 50 km² (Fenberg et al., 2012). It was found that within their borders, reserves show the following: a) an average 238% increase in biomass of fauna and seaweeds, b) an average increase of 116% in density of

seaweed and animals (number per area), c) an increase in fish size of 13% on average, and d) an increase in species diversity (number of species) of 19% overall. Similar patterns are observed in reserves across the world (PISCO, 2007).

Information on whether extraction of fish and shellfish is allowed on Natura 2000 sites is not available for the network as a whole. In general, Natura 2000 sites are not closed for commercial fisheries, or only partly so. Moreover, individual sites are mostly designated with the objective of protecting a certain species or habitat, rather than all the biodiversity features occurring at that site. As such, in some sites, significant activities such as industrial fishing is allowed, if it is deemed that the activities does not pose a risk to the achievement of the conservation objectives of the site.

2) Well enforced: Another criterion is whether the measures applied in order to meet conservation objectives are actually well enforced; sometimes, in reality, a proportion of the networks are 'paper parks'

offering no true protection. Again, it is not possible to assess this quantitatively at EU scale, due to lack of data showing the effects of management measures, e.g. within Natura 2000 sites and similar areas outside the borders of the sites. Perhaps this may be remedied through the monitoring programmes established under the MSFD to better evaluate the effect of the 'other spatial protection measures' in place. Also, there is no uniform reporting of the categories of the management schemes in place, e.g. a harmonised approach on how to classify an MPA protection level, using IUCN management categories, for instance. A classification of MPA protection level could be developed around identified criteria for what makes a MPA work.

3) Age: Edgar et al. (2014) noted that MPA age is a chief factor in determining the effectiveness of MPAs, but sometimes visible effects can be observed even after a few years (Box 7.1). The first marine Natura 2000 sites were designated in 1995 with a significant increase in offshore waters after 2005. As such, the Natura 2000 network sites are reaching an age where visible results might be expected, despite additional sites being designated. Network age will most likely be a relevant criterion for many marine Natura 2000 species which are long-lived with a natural slow population growth. In an EU context, it might be more useful to apply the date of entry into force of management plans and measures, in order to reflect the true recovery potential of the site. It is therefore essential to view this criterion in combination with management effectiveness, so as to distinguish the impact of MPA age from the implementation of management.

4) Size: In their study on shallow-reef fish communities, Edgar et al. (2014) found that in order to be effective, MPAs should be large, spanning more than 100 km². Approximately 89% of the marine Natura 2000 **area** and 85% of the national designated sites **area** are found within sites < 100 km² (EEA, 2015b). The **number of sites** > 100 km² constitute only 21% and 3%, respectively, of the total number of sites. So, in terms of number of sites, only a small proportion fulfil this criteria. The average size of the sites increases as we move from the coast to the open seas (EEA, 2015c). However, European marine reserves clearly show that

positive effects on biodiversity are seen from smaller MPAs with restrictive, well-enforced management measures in place (Fenberg et al., 2012). As such, the effect of size might be related to other criteria, i.e. management, and should be further studied.

5) Isolation: The degree of isolation of MPAs from human activities is not difficult to assess. Europe is second only to Asia in population density, and coasts have especially high population densities (EEA, 2013), meaning that very few coastal sites can be considered to be isolated from human activities. In this context, it is worth noting that the Azores were the only place with habitats in 'favourable conservation status' from 2001 to 2006, with the addition of one assessment from the Black Sea in the 2007 to 2012 period. If the other factors were better informed, criteria for assessing 'isolation' could be developed for EU MPA networks using existing reported information.

In conclusion, perhaps the time is right to start an open, transparent process for developing a European-applicable system to evaluate the effectiveness of the European MPAs and MPA networks. Such a process could result in clear statements articulating the vision and high-level goals that should frame the EU MPA network envisaged within the MSFD, i.e. encompassing the existing networks. Secondly, clear goals and objectives could be developed, underpinning a common approach for MPA managers in EU Member States to understand the intended technical scope of the MPA network required under the MSFD, including its connection to other networks? Thirdly, should this include a classification of MPAs and 'spatial protection measures', clearly distinguishing between those established for protecting biodiversity in general and those established for other purposes, thus accounting for the multiple approaches for designation of MPAs in European waters? Lastly, relevant operational criteria allowing an objective, consistent evaluation of the effectiveness of MPAs in protecting biodiversity in regional seas could be developed and agreed.

At this point in time, no common guidance exists in Europe concerning what makes MPAs and networks of MPAs work, nor on how to assess this at European scale.

8 Reflections for the next 20 years of marine protected area designations

- Europe needs to implement a modern, holistic approach to MPA design, management and evaluation, if EU MPA networks are to reach their potential in protecting marine biodiversity.
- The ecosystem-based approach introduced by the MSFD and the CFP provides an opportunity to employ a holistic approach towards designing and managing MPA networks in Europe's seas.
- Only comprehensively managed MPAs and MPA networks can help accomplish the visions and objectives of existing EU policies and legislation i.e. halting the loss of biodiversity.

The opening lines of the 2015 EEA report *State of Europe's seas* state: 'Europe's coastal areas and seas of today sustain ecosystems that have been significantly altered by centuries of human exploitation'. This succinctly describes the current **state of affairs**. Europe's seas and their ecosystems, habitats and species are experiencing change caused by human activity, which is ultimately jeopardising the sea's capacity to continue delivering the services and benefits our societies have become accustomed to (EEA, 2015c).

MPA networks could play a crucial role in reversing these systemic changes observed across Europe's seas, as indicated by scientific studies and reflected in UN, EU and national policies. The networks are a key measure to help meet the EU policy objectives of halting the loss of biodiversity, achieving clean, healthy and biologically diverse seas and securing sustainability, including growth and jobs.

As such, their role in the European community's vision of living well within planetary limits (as per the 7EAP) is, in principle, simple: they must act as sanctuaries, with the primary purpose of safeguarding marine life. No other management measure delivers this sort of 'biodiversity vault'. Therefore, networks of MPAs play a unique part in our endeavours to ensure our seas are healthy, clean and sustainable. However, roughly 20 years of establishing networks of MPAs has had no marked positive effect, at European scale, on the conservation objectives, i.e. the conservation status of vulnerable species and habitats (Table 8.1).

In the same time period, systemic changes in our marine ecosystems, i.e. regime shifts, have been observed across Europe's seas, caused by multiple,

interacting pressures and complex, cumulative impacts (EEA, 2015a). This indicates that more than ever, viable and effective management solutions are needed for maintaining or restoring the resilience of our seas. The lack of visible effects does not mean that MPAs cannot deliver a range of positive results. Individual **well-managed** MPAs, e.g. reserves, have a demonstrated localised, decidedly positive effect on density of species, biomass, size and species richness — effects that can extend over the borders of individual sites. Therefore, there is no doubt that MPAs as a measure work well, if properly implemented.

This raises the question: Is there some way to improve the networks, and if so, are the necessary options available within the existing policy framework?

Towards efficient networks of MPAs in the EU

The answer lies in locating the factors that make networks as well as individual MPA sites work, and comparing these with the current state of Europe's networks of MPAs (Table 8.1). Europe has made significant progress in designating protected areas. The UN target of 10% has already been reached in 3 of 10 regional seas, even though MPA coverage alone does not include 'other spatial protection measures' in this case.

The network in place is not yet considered representative nor ecologically coherent. This might be partly because the original drivers behind the main EU MPA designation scheme, the Birds and Habitats Directives, do not reflect a comprehensive

Table 8.1 Indicative summary of MPA network progress in Europe's seas

Status and trends of ecosystem features				
	Status ecosystem features	5-10 year trend	Information availability and quality	Read more
Seabed habitats				EEA, 2015b
Marine invertebrates				EEA, 2015b
Marine fish				EEA, 2015b
Turtles				EEA, 2015b
Seabirds				EEA, 2015b
Marine mammals				EEA, 2015b
Ecosystem processes and functions				EEA, 2015b
MPA network sea area coverage (2012)				
	Objective	Status	Information availability and quality	Read more
Natura 2000	None (on total cover)	4%		EEA, 2015a
National sites	Variable	1.9%		EEA, 2015a
Total network cover Regional seas	10% in each of the 10 regional seas	3 regional seas have reached 10%		EEA, 2015a
Total network cover	10%	5.9%		EEA, 2015a
Representative and coherent MPA networks				
	Objective	Target reached	Trends	Information availability and quality
Natura 2000	Establish coherent and representative networks of MPAs			This report
MSFD				This report
HELCOM				This report
OSPAR				This report
Barcelona Convention				This report
Bucharest Convention				This report
All networks combined				This report
Well-managed and effective MPA networks				
	Objective	Status	Information availability and quality	Read more
Natura 2000	Ensure good management			N/A
No-take sites	Implement no-take			N/A
Management	Well managed			N/A
Age	>10 years old			N/A
Size	>100 km ²	Area	No of sites	N/A
Isolation	Isolated			N/A

Legend (assessment indicative of):

Status and trends		Information availability and quality	
	Status not good/target not reached		Limited information
	Status or trends show mixed picture		Sufficient information
	Status good/improving trends dominate		Good information

Note: The indicative assessment builds on information analysed in the relevant sections and on expert judgement. Information sources include EU reporting obligations, EEA indicators, EU and regional reports, peer-reviewed papers.

Note: The indicative assessment builds on information availability and quality, in order to make comparable and coherent evaluations at EU level and across regional seas.

understanding of the marine ecosystem as it is currently implemented, and do not embody the principle of an ecosystem-based management approach so as to build resilience for the system as a whole. For example, while more than 1 000 marine habitats have been described, only 9 coastal/marine habitats were specified by the Habitats Directive, omitting most soft-bottom habitats, for instance, from formal protection schemes. Similarly, key species and key species groups, such as commercially exploited fish, are almost absent from nature conservation efforts. However, it should be noted that some Member States are making national efforts to address this shortfall through the designation of additional MPAs under domestic legislation.

Other aspects also contribute to current gaps. Some Member States are not yet deemed sufficient in their designations under the nature directives, and large differences exist between coastal and offshore coverage of the networks. As such, the marine Natura 2000 network still has a way to go if it is to perform its self-defined role: to be representative and ecologically coherent, while simultaneously reflecting the ecosystem-based approach that is now enshrined in EU marine policies. Therefore, more emphasis should be placed on 'well-managed' representativity, coherence and adequacy of the network when completing the network in the context of combined implementation of the nature directives and the MSFD.

Simple yet complex solutions

Besides considering the factors operating at network level, it is also necessary to identify and examine criteria that allow individual MPAs to meet their conservation objectives, and compare these against current management approaches. Existing global research efforts indicate that several criteria are crucial if MPAs are to be effective as individual tools in the longer term. Here, it is important to acknowledge that several criteria have to be fulfilled for an MPA to deliver its conservation objectives, and that the effects may increase exponentially if more conditions are in place (Halpern, 2014).

Europe is doing well on one of the five criteria: age. The age of individual MPAs in the network is increasing (with new sites being added) across all regional seas. Information for assessments has already been reported. The relation between the size and the effectiveness of MPAs needs to be further explored in a European context, as Fenberg (2012) adeptly demonstrated that even small reserves can have a marked positive effect on biodiversity. The assumption

that everything within a site is equally protected does not stand for Natura 2000 sites, where listed habitats and species receive higher protection levels than those not listed. Size can be measured based on existing information, though improved criteria for relating MPA size to effective management will need to be developed.

MPAs work better when isolated by deep water or expanses of sand. Isolation will not be possible for all sites, nor should it be planned for all sites. As representativity is increasingly emphasised, and more offshore sites are designated, this factor will grow for the network as a whole, almost by default. Criteria for measuring isolation could be developed based on existing reported data to further inform management efforts. Lastly, isolated sites might perform well, though their isolation will generate less value for the connectivity of the network as a whole.

As such, Europe is at the threshold of having its MPAs fulfil their conservation objectives. However, two factors require further development. One is to ensure that individual MPAs are well managed and conservation objectives properly enforced. The challenge lies in the fact that there is no simple way to evaluate management effort and success at EU level. Solutions might include implementing an MPA management classification scheme indicating the protection level of individual sites, thus recognising that MPAs are and have been designated for many different purposes. Existing MPA reporting streams could be adapted to include information on the management category, to inform on effectiveness for protecting biodiversity. Another part of the solution might involve extending protection to **all** ecosystem features within the borders of some MPAs, rather than focusing on a limited number of features, e.g. a specific habitat or species.

The last measure is probably the most controversial but is also likely to be very effective: to implement a consistent permanent no-extraction policy (no-take) across entire EU MPAs or parts of them. This has been demonstrated to be a powerful, cost-efficient measure that works for MPAs across the globe (PISCO, 2007; Edgar et al., 2014).

Perhaps the time has come for EU Member States to consider setting relevant European criteria so as to evaluate the effectiveness of MPAs and their benefits through large-scale testing on existing regional networks of MPAs. They should examine the benefits both for nature and from a socio-economic perspective, as this could help better inform discussion on the use of protected areas in the EU's transition to a green economy.

Whatever the range of solutions or criteria chosen, the effect of the measures should be consistently monitored for selected MPAs in each management category. Performance can be assessed using parameters such as density of species, biomass, size and species richness. Such performance monitoring could provide a proper large-scale evaluation of the effectiveness of MPAs and networks of MPAs. Policymakers and stakeholders all have vested interests in implementing working policy and local management measures to fulfil the common policy vision of halting biodiversity loss.

Emerging policies present opportunities

Europe already has a comprehensive policy framework in place. EU policies such as the Biodiversity Strategy and the CFP, legislation such as the Habitats and Birds Directives and the MSFD, and the ongoing efforts in the RSCs and the stakeholder-led processes appearing in some Member States (e.g. the United Kingdom) clearly indicate that Europe possesses the necessary policy platform to take action. With their EBM, the MSFD and the CFP

offer a timely opportunity to help MPAs deliver their full potential as management measures, by taking the full range of species and habitats into consideration when developing management measures.

It would be especially relevant to see how Natura 2000, the MSFD and the CFP could be employed in a joint effort to establish no-take sites beyond 12 NM. It is clear from best practice examples and scientific research that the MPAs can work as a measure, if implemented properly. As such, there appears to be little need for new legislation, but rather a need to shift our attention towards the full implementation of existing policies, including greater focus on the intentions of such policies. The EU community already has an extensive knowledge-base, which our MPA networks can use to deliver conservation objectives. Recalibrating existing policy approaches so as to employ MPAs with this in mind is necessary if they are to deliver their full potential and fully support the transition to a green economy. The next 20 years of MPA designations and their contribution to halting the loss of biodiversity in Europe's seas will be shaped by whether the political will is strong enough to act on the knowledge and experience already existing in Europe.



Photo: European bullhead (*Cottus gobio*) hiding in seaweed in the Quarck World Heritage Site, Finland.
© Metsähallitus, 2007

References

- Abdulla, A., Gomei, M., Maison, E. and Piante, C., 2008, *Status of Marine Protected Areas in the Mediterranean Sea.*, UCN, Malaga and WWF, France.
- CBD, 1993, *Convention on Biological Diversity*, Secretariat to the Convention on Biological Diversity, Montreal.
- CBD, 2004, 'Report of the Seventh meeting of the Conference of the Parties to the Convention on Biological Diversity, 9–20 February 2004, Kuala Lumpur, Malaysia.
- CBD, 2010, 'Aichi Biodiversity Targets', *Convention on Biological Diversity* (<https://www.cbd.int/sp/targets/rationale/target-11/>) accessed 31 August 2015.
- Costello, M. J. and Wilson, S. P., 2011, 'Predicting the number of known and unknown species in European seas using rates of description: Predicting species diversity', *Global Ecology and Biogeography* 20(2), pp. 319–330.
- Davies, C. E., Moss, D. and Hill, M. O., 2004, 'EUNIS Habitat Classification Revised 2004', (http://eunis.eea.europa.eu/upload/EUNIS_2004_report.pdf) accessed 6 March 2014.
- Defra, 2010, *Marine Conservation Zone Project: Ecological Network Guidance*, Natural England and joint Nature Conservation Committee, Peterborough, UK.
- EC, 2006, Communication from the Commission to the Council and the European Parliament — Halting the loss of biodiversity by 2010 and beyond — Sustaining ecosystem services for human well-being., COM(2006) 0216, Brussels, 10.1.2007.
- EC, 2007, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. An Integrated Maritime Policy for the European Union, COM(2007) 575 final.
- EC, 2008, Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (MSFD).
- EC, 2011, Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions. Our life insurance, our natural capital: an EU biodiversity strategy to 2020, COM(2011) 244 final.
- EC, 2013a, 'Conclusions on the representativity of habitats and species in Natura 2000', (<https://circabc.europa.eu/w/browse/0c011fbc-edd4-49a6-8f3d-b67901a2084d>).
- EC, 2013b, 'The 7th Environment Action Programme (EAP)', (<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D1386&from=EN>).
- EC, 2014, 'Programmes of measures and exceptions under Marine Strategy Framework Directive — Recommendations for implementation and reporting. Marine Strategy Framework Directive (MSFD): Common Implementation Strategy', Marine Directors, Meeting of 25 November 2014, Rome, Italy.
- Edgar, G. J., Stuart-Smith, R. D., Willis, T. J., Kininmonth, S., Baker, S. C., Banks, S., Barrett, N. S., Becerro, M. A., Bernard, A. T. F., Berkhout, J., Buxton, C. D., Campbell, S. J., Cooper, A. T., Davey, M., Edgar, S. C., Försterra, G., Galván, D. E., Irigoyen, A. J., Kushner, D. J. et al., 2014, 'Global conservation outcomes depend on marine protected areas with five key features', *Nature* 506(7487), pp. 216–220.
- EEA, 2013, *Balancing the future of Europe's coasts: knowledge base for integrated management.*, European Environment Agency, Copenhagen, Denmark.
- EEA, 2015a, 'Article 17 reports and assessments 2007–2012' (<http://www.eea.europa.eu/data-and-maps/data/article-17-database-habitats-directive-92-43-eeec-1>).
- EEA, 2015b, *Spatial analysis of marine protected area networks in Europe's seas*, EEA Technical report, European Environment Agency, Copenhagen, Denmark (in prep.).
- EEA, 2015c, *State of Europe's seas*, EEA Report No 2/2015, European Environment Agency, Copenhagen, Denmark.

- EU, 1992, Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, OJ L 206, 22.7.1992, p.7.
- EU, 2009, Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, OJ L 20, 26.1.2010, p. 7–25.
- Fenberg, P. B., Caselle, J. E., Claudet, J., Clemence, M., Gaines, S. D., Antonio García-Charton, J., Gonçalves, E. J., Grouard-Colvert, K., Guidetti, P., Jenkins, S. R., Jones, P. J. S., Lester, S. E., McAllen, R., Moland, E., Planes, S. and Sørensen, T. K., 2012, 'The science of European marine reserves: Status, efficacy, and future needs', *Marine Policy* 36(5), pp. 1 012–1 021.
- Gabrié C., Lagabriele E., Bissery C., Crochelet E., Meola B., Webster C., Claudet J., Chassanite A., Marinesque S., Robert P., Goutx M., Quod C., 2012, *The Status of Marine Protected Areas in the Mediterranean Sea*, MedPAN & RAC/SPA.
- Government of Canada, 2011, *National Framework for Canada's Network of Marine Protected Areas.*, Fisheries and Oceans Canada, Ottawa, Canada.
- Halpern, B. S., 2014, 'Conservation: Making marine protected areas work', *Nature* 506(7487), pp. 167–168.
- HELCOM, 2009, *Biodiversity in the Baltic Sea — An integrated thematic assessment on biodiversity and nature conservation in the Baltic Sea.*, Baltic Sea Environment Proceedings 116B, Helsinki Commission, Helsinki, Finland.
- HELCOM, 2010, *Towards an ecologically coherent network of well-managed Marine Protected Areas — Implementation report on the status and ecological coherence of the HELCOM BSPA network: Executive Summary.*, 124A, Helsinki Commission, Helsinki, Finland.
- HELCOM, 2015, 'Marine protected areas/Basic facts', (<http://www.helcom.fi/action-areas/marine-protected-areas/basic-facts/>) accessed 1 September 2015.
- IUCN-WCPA, 2008, *Establishing Marine Protected Area Networks — Making It Happen*, IUCN-WCPA, National Oceanic and Atmospheric Administration and the Nature Conservancy, Washington D.C.
- NOAA, 2015, *Framework for the National System of Marine Protected Areas of the United States of America.*, National Marine Protected Areas Center, NOAA's Office of National Marine Sanctuaries, Silver Spring, MD.
- Northern Ireland Assembly, 2013, Marine Act (Northern Ireland) 2013.
- Noss, R. F., 1992, 'The Wildlands project: Land Conservation Strategy', pp. 10–25.
- OSPAR, 2006, 'Guidance on developing an ecologically coherent network of OSPAR marine protected areas. Reference number 2006-3.'
- OSPAR, 2010, *2010 Quality status report*, The Convention for the Protection of the marine Environment of the North-East Atlantic (OSPAR), London, UK.
- OSPAR, 2013, *2012 Status Report on the OSPAR Network of Marine Protected Areas*, OSPAR Commission, London, UK.
- Palumbi, S. R., 2003, 'Population genetics, demographic connectivity, and the design of marine reserves.', *Ecological Applications* 13(sp1), pp. 146–158.
- PISCO, 2007, *The Science of Marine Reserves*, 2nd Edition, Interbational Version, Patnership for Interdisciplinary Studies of Coastal Ocean, 22. p.
- Scottish Parliament, 2010, Marine (Scotland) Act, 2010 asp 5.
- Smith, J., Patterson, M., Alidina, H. M. and Ardron, J., 2009, *Criteria and tools for designing ecologically sound marine protected area networks in Canada's marine regions.*, WWF-Canada, Halifax, Canada.
- Toropova, C., Melanie, I., Laffoley, D., Matthews, E., Spalding, M. and (eds), 2010, *Global Ocean Protection: Present Status and Future Possibilities.*, Brest, France: Agence des aires marines protégées, Gland, Switzerland, Washington, DC and New York, USA: IUCN WCPA, Cambridge, UK : UNEP-WCMC, Arlington, USA: TNC, Tokyo, Japan: UNU, New York, USA: WCS.
- UK Government, 2009, Marine and Coastal Act 2009, c. 23.

Acronyms and units

ACCOBAMS	Agreement of the Conservation of Cetaceans in the Black Sea, the Mediterranean and Contiguous Atlantic Area
BSPA	Baltic Sea Protected Area
CBD	Convention on Biological Diversity
CDDA	Common Database on Designated Areas
CFP	Common Fisheries Policy
EBM	Ecosystem-based approach to management
EEA	European Environment Agency
EEZ	Exclusive Economic Zone
EU	European Union
GES	Good environmental status
HELCOM	Helsinki Commission (Baltic Marine Environment Protection Commission)
IUCN	International Union for Conservation of Nature
MCZ	Marine Conservation Zone
MPA	Marine protected area
MSFD	Marine Strategy Framework Directive
NM	Nautical mile, a unit used in measuring distances at sea, equal to 1 852 metres. As yet there is no internationally agreed symbol, but the symbols M, NM, Nm, and nmi are all used. This document uses NM.
OSPAR	Oslo and Paris Conventions (Convention for the Protection of the Marine Environment of the North-East Atlantic)
PoM	Programme of Measures
RSC	Regional Sea Convention
SAC	Special Area of Conservation
SPA	Special Protection Area
SPAMI	Special Protected Area of Mediterranean Interest

European Environment Agency

Marine protected areas in Europe's seas
An overview and perspectives for the future

2015 — 35 pp. — 21 x 29.7 cm

ISBN 978-92-9213-692-5
doi:10.2800/99473

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:
via EU Bookshop (<http://bookshop.europa.eu>);
- more than one copy or posters/maps:
from the European Union's representations (http://ec.europa.eu/represent_en.htm);
from the delegations in non-EU countries (http://eeas.europa.eu/delegations/index_en.htm);
by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm) or calling
00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

(*). The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (<http://bookshop.europa.eu>).



European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark

Tel.: +45 33 36 71 00
Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

