

An underwater photograph showing a large, brown, tangled fishing net hanging vertically in the water. The net is covered in seaweed and other marine growth. Several small, yellowish fish are swimming around the net. The background is a deep blue ocean with a bright light source at the top, creating a shimmering effect on the water's surface. The overall scene suggests an unmanaged and unprotected marine environment.

**Unmanaged =  
Unprotected:**

Europe's marine  
paper parks

## Credits

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**Cover photo:** Trammel net abandoned inside *Área marina de La Isleta*, a Natura 2000 marine protected area in the Canary Islands, Spain. © OCEANA / Carlos Minguell

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# Executive Summary

In the face of intense human pressure on European seas, a network of well-managed marine protected areas (MPAs) is critical for marine biodiversity protection. In 2018, the EU (including, at the time, the United Kingdom) declared having met international targets for marine conservation, by designating more than 10% of its waters as MPAs. However, this declaration of success ignored the fact that designation is just one step towards achieving real protection. Without effective management, designated MPAs remain mere 'paper parks' that provide little to no actual protection.

As the EU and the UK aim towards a more ambitious target of protecting 30% of the ocean, a key question remains: **how protected are existing European MPAs?** In this report, we address this question from two different angles, considering: 1) the extent of damaging human activities inside MPAs; and 2) whether management plans and measures are sufficient to address these threats.

We first examined the spatial overlap between the largest network of European MPAs (Natura 2000, comprising 3449 MPAs) and 13 human activities that represent direct threats to marine species and habitats in Europe. Our analysis revealed a troubling picture: **nearly three-quarters of sites were affected by one or more threats, and those not affected represented a mere 0.07% of the total area of the Natura 2000 MPA network.** At the national level, threats were present in more than half of the MPAs in each of the 23 countries analysed. The most widespread threats were maritime traffic and fishing, affecting 66% and 32% of MPAs, respectively. Across the entire network, **MPAs faced an average of two threats, with some sites in Germany, the Netherlands, and the UK facing eleven or more threats each.**

Focusing on 1945 Natura 2000 MPAs designated specifically for the protection of seabed habitats exposed the extent to which theoretically protected habitats face direct threats. Fifty-five percent of those MPAs were subject to one or more seabed threats, and MPAs with six or even eight (out of a maximum of eight) seabed threats

were documented in the waters of eight countries across the Atlantic and Baltic. **More than 500 Natura 2000 MPAs designated for seabed habitat protection permitted 'high-risk' fishing: fishing with gears that are known to damage those very habitats.** Such fishing was so pervasive that only 14% of the total area designated for habitat protection lay within MPAs that were not exposed to high-risk gears. High-risk fishing was particularly prevalent within MPAs that are intended to protect reefs, sandbanks, and *Posidonia* beds.

In the second part of our assessment, we evaluated management plans from a selection of the largest Natura 2000 MPAs, by country. According to official information provided by countries to the European Commission, **management plans were reported to exist for only 47% of the 43 sites assessed. Where management plans did exist, they had often been seriously delayed – leaving sites unmanaged for up to 11 years – and 80% of plans were found to be generally incomplete.** Despite establishing clear conservation objectives, most of the assessed plans were characterised by clear weaknesses that hinder the effectiveness of management: a lack of deadlines for implementing measures; a failure to manage specific features for which sites were designated; a failure to address major threats that put those features at risk (like fishing or dredging); and the absence of provisions for surveillance and monitoring.

Our findings help to better understand and quantitatively estimate the scale of the problem of European marine 'paper parks', while also illustrating the underlying failures and weaknesses of current MPA management approaches. The intensity of threats, together with weak management of Natura 2000 MPAs raises questions about the very essence of MPAs in Europe: many MPAs aim for just the legal minimum protection for a limited number of features, while permitting damaging activities that are incompatible with wider ecosystem protection and recovery. This situation is further evidenced by the ongoing decline of marine species and habitats *inside* European MPAs.

## At a glance

**551 296 km<sup>2</sup>:** Total marine area covered by Natura 2000 MPAs in 2018

**380 km<sup>2</sup>:** Total area not affected by any of 13 threats assessed

**0:** Number of countries with fewer than 50% of their MPAs facing threats

**510:** Number of habitat-‘protecting’ MPAs that allow habitat-damaging fishing gears

**86%:** Percentage of ‘protected’ seabed in MPAs exposed to high-risk fishing gears

**47%:** Percentage of MPAs assessed that reported having a management plan

**80%:** Percentage of management plans assessed that failed to lay a solid basis for management

**12:** Number of threats (out of 13) identified in some ‘protected’ areas

**0.5%:** Percentage of European marine area protected by real MPAs in 2018

**30%:** Percentage of European marine area the EU and the UK have committed to effectively protect by 2030

With the biodiversity crisis high on the European political agenda, Oceana urges the European Commission, EU Member States, and the UK to significantly step-up efforts to manage their MPAs, deliver proper protection and restrict the most impacting human activities.

Specifically, Oceana issues the following key recommendations:

- The European Commission should **investigate why EU Member States have failed to deliver ‘favourable conservation status’** of marine habitats, and **open systematic infringement procedures** against Member States that have failed to adopt adequate management measures for Natura 2000 MPAs.
- The United Kingdom, EU Member States and the European Commission should **only count MPAs against international targets once sites are actively managed.**
- EU countries and the UK should **follow a ‘whole-site approach’ to management of MPAs**, shifting away from ‘feature-based’ management to the protection of wider ecosystems processes and functions.
- The European Commission, EU Member States, and the UK should **prohibit destructive fishing gears inside MPAs** that threaten the very features sites are designated for, as they are intrinsically incompatible with MPA objectives.
- The European Commission should **reject any joint recommendation submitted under Article 11 of the Common Fisheries Policy that allows destructive fishing gears to be used inside MPAs.** Similarly, the **UK government should prohibit bottom-fishing in its offshore MPAs.**
- The European Commission should focus its upcoming 2021 EU Action Plan to conserve fisheries resources and protect marine ecosystems on **tackling the damaging impacts of bottom-trawling on seabed biodiversity, and enact a ban on bottom-trawling in all EU MPAs.**
- The EU and the UK should drastically increase the level of protection inside MPAs, and adopt a target of **at least 10% strictly protected MPAs that prohibit all extractive and industrial activities.**
- The European Commission should **carry out a comprehensive review of threats occurring in the marine Natura 2000 network**, and develop appropriate sectoral guidance documents to better implement EU legislation underpinning Natura 2000 in relation to specific economic activities.

# The European MPA network: Real protection or ‘paper parks’?

European seas are under severe pressure. A wide array of human activities, both at sea and on land, are pushing marine ecosystems to their limits and threatening the life they support.<sup>1</sup> In the face of such intense pressure, one of the key tools needed to safeguard Europe’s marine biodiversity and to maintain and recover healthy ecosystems is a network of well-managed marine protected areas (MPAs). These areas, though protected under a variety of frameworks, share the same broad aims: to conserve threatened, vulnerable, or representative habitats and species.

In Europe, the area designated as MPAs has increased slowly over the past 25 years, but expanded more rapidly in recent years, driven partly by the aim of meeting international, EU, and national targets for MPA networks. In 2018, the European Union announced that it had met key international commitments, by designating more than 10% of its marine and coastal waters two years before the 2020 deadline associated with targets set under the Convention on Biological Diversity (CBD) and Sustainable Development Goal 14.<sup>2</sup>

However, two major problems belie this claim. First, while the level of protection reported in 2018 (10.8%)<sup>2</sup> captured the extent of MPA designation at the level of the EU,<sup>3</sup> the situation at the level of individual countries varied widely, and not all sub-regions or countries had met the target. Even today, two years after the EU declaration, eight countries have not yet designated 10% of their waters as protected (Figure 1). Two of these countries (Ireland and Portugal) lag particularly far behind, having each designated less than 5% of their waters as MPAs – despite having committed at the national level to achieving the 10% target of protection by 2020.

Second, the EU declaration of success ignored a critical aspect of both the Aichi 11 and SDG 14 targets: neither target is about merely MPA *designation*. Instead, they call for MPAs that deliver effective conservation. Aichi Biodiversity Target 11 aimed for 10% of coastal and marine areas to be “conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures,”<sup>4</sup> while the SDG 14 target called on countries to “conserve at least 10 per cent of coastal and marine areas.”<sup>5</sup> By claiming conservation success based only on having achieved 10% designation, the EU appeared to ignore the fact that **designation is only one step in the process towards real spatial protection.**<sup>6</sup> **Without effective management, designated MPAs remain mere ‘paper parks’ that provide little to no real protection of species or habitats.** Such areas fail to conserve the features that they are intended to protect, and counting them towards spatial protection targets creates a false impression of achievement.<sup>7</sup>

Recently, policy objectives for marine protection in Europe have moved beyond the 2020 targets, to a more ambitious goal of 30% protection, reflecting long held scientific thinking about minimum necessary levels of protection.<sup>8,9,10</sup> The *EU Biodiversity Strategy for 2030* recognises that the existing network of protected areas is not sufficient for nature protection and restoration and that a minimum of 30% of the sea should be protected in the EU, with at least one-third of that area under strict protection.<sup>11</sup> The United Kingdom has also adopted a target of 30% protection, and has called on other nations to follow suit in the lead-up to the adoption of a post-2020 global biodiversity framework under the CBD.<sup>12</sup> As the EU and the UK look to further expand their MPA networks, a key question remains: how protected are existing European MPAs? In this report, we address this

question from two different angles, considering:  
 1) the extent of damaging human activities inside MPAs;  
 and 2) whether management plans and measures are sufficient to address these threats. We look beyond legal minimum requirements to ask whether European MPAs can actually be considered protected or if – despite

public declarations of success – they exist only on paper. Considering the degraded state of European marine ecosystems, and intense, ongoing, and increasing human pressures on our seas,<sup>1</sup> it is critical to ensure that MPAs are actually delivering the conservation benefits for which they are intended.

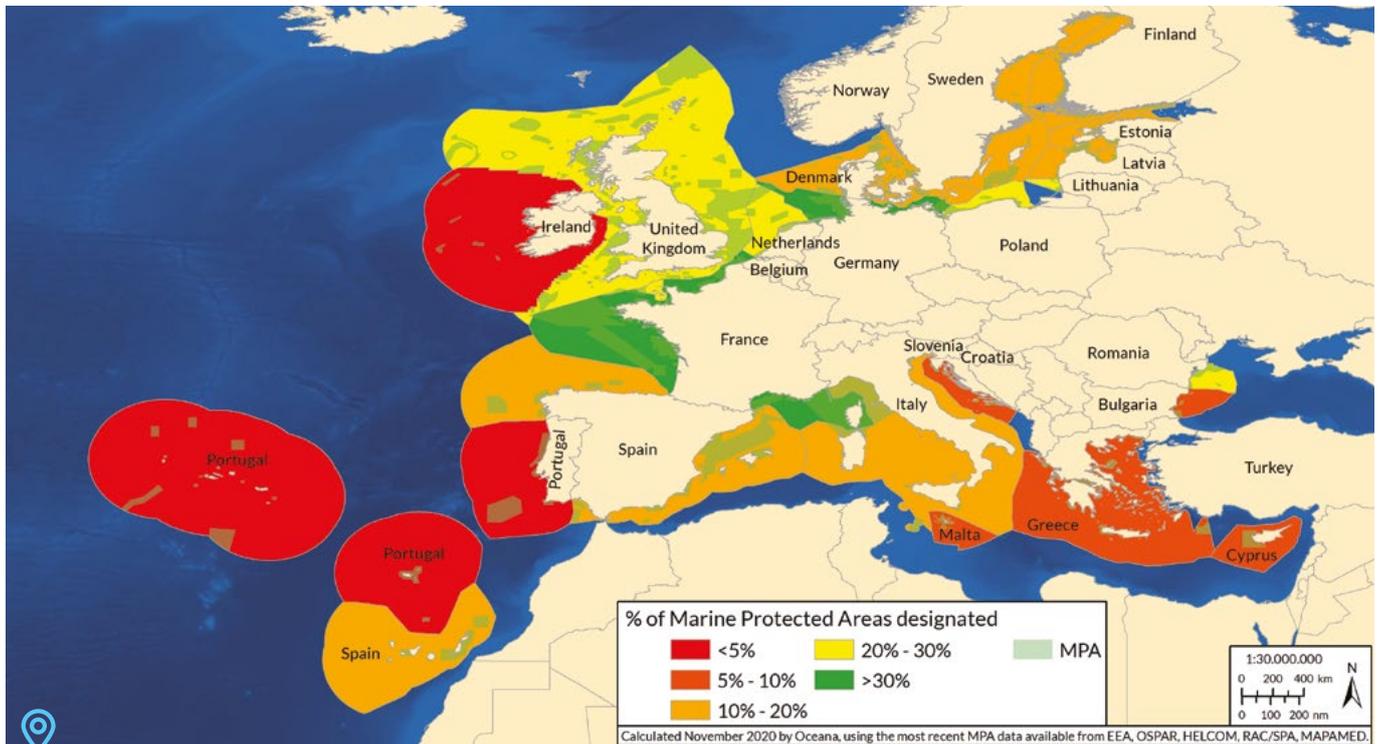


Figure 1. Percentage of waters designated as marine protected areas by EU Member States and the United Kingdom.

## Box 1. A sneak peek at Europe's unmanaged MPAs

European MPAs have frequently been described as mere ‘paper parks’, designated areas that exist in legislation and on maps, but that fail to provide real protection to the ecosystems within their boundaries. Recent studies have shed light on the management failings underlying European paper parks, particularly in relation to extractive and destructive activities inside their boundaries. Below are some key figures:

- As of early 2018, 85% of EU MPAs had no management plan in place. Whereas the EU network of MPAs covered 12.4% of EU seas, only 1.8% of EU seas were part of MPAs with management plans in place.<sup>13</sup>
- For 95% of the total protected area in the Mediterranean Sea (73% of the MPAs), no differences exist between the regulations imposed inside MPAs, compared with those outside.<sup>14</sup>
- Only five out of 73 offshore MPAs in the UK ‘may be’ progressing towards their conservation targets, while 21 are ‘unlikely’ to be. Only two have long-term site condition monitoring available.<sup>15</sup>
- In 2017, 59% of European MPAs were commercially trawled, and 38% were subject to a higher trawling intensity than outside protected areas.<sup>16</sup>
- In 2013, 11 630 hours of fishing took place within 69 HELCOM MPAs, of which 70% was with bottom-contacting gear.<sup>17</sup>
- An analysis of 31 579 threats recorded in 1692 Natura 2000 MPAs found that fishing (55% of sites) was one of the most widespread threats reported within EU MPA boundaries.<sup>18</sup>

# Threats across the Natura 2000 MPA network

## Methods

### 1. Sites: MPAs within the Natura 2000 network

To assess the nature and scale of threats across European MPAs, we focused only on those marine sites within the Natura 2000 network of protected areas, for two reasons. First, Natura 2000 MPAs represent the largest network of European MPAs, accounting for nearly 70% of protected marine area in the EU and the UK.<sup>19</sup> Second, considering only these MPAs allowed for a clearer comparison across sites, because they have been designated under a consistent legal framework: the Birds and Habitats Directives.

Sites within the Natura 2000 network are intended to safeguard Europe's most valuable and threatened species and habitats.<sup>20</sup> MPAs designated under the Birds Directive (i.e., Special Protection Areas [SPAs]) are meant to protect the habitats of threatened and migratory bird species; those designated under the Habitats Directive (Sites of Community Importance [SCIs], which later become Special Areas of Conservation [SACs]) are meant to protect certain listed habitats and non-bird species. In both cases, an important aspect of Natura 2000 protected areas is the fact that although their designation implies strong legal protection for designated features against damage or deterioration, that protection *only* applies to the designated features, rather than to the protected areas as a whole. This has led to a 'feature-based' management approach that focuses only on avoiding direct impacts on designated features,

rather than a 'whole-site' approach that takes into account the ecological integrity of MPAs.<sup>21,22</sup> Feature-based management, in turn, opens the door to human activities within MPAs that are not compatible with wider ecosystem protection and recovery.

We selected all of the MPAs within the Natura 2000 network, according to the method used by the European Environment Agency in its 2015 assessment of European MPA networks.<sup>23</sup> Because there is no official list of Natura 2000 MPAs, this method draws on two complementary data sources that describe the Natura 2000 network: tabular data describing the characteristics of all Natura 2000 sites (terrestrial and marine), and spatial data depicting the boundaries of each one.<sup>24</sup> Using data reported to the European Commission by Member States at the end of 2019, we identified those sites within the tabular data with reported marine area, with marine habitat categories, or with specific marine habitats or species (7303 sites in total).<sup>25</sup> We then combined those data with spatial data on Natura 2000 boundaries, from which we retained only those sites with area lying seaward of the coastline (3967 sites).<sup>26</sup> Finally, we selected those sites which could be identified as MPAs on the basis of both the tabular and the spatial data, yielding a total of 3449 Natura 2000 MPAs.

These MPAs represented a diverse array of areas, across the waters of the 23 countries where they are located (see Annex A). They varied widely in the marine area that they cover, ranging from several sites with less than 10 m<sup>2</sup> to the French SPA *Mers Celtiques - Talus du golfe de Gascogne*, which spans 71 960 km<sup>2</sup>. Within this range of sizes, the majority of MPAs were relatively small (Figure 2).

The median marine area was just 3.8 km<sup>2</sup>, far smaller than minimum sizes of 20-30 km<sup>2</sup> that are typically recommended for MPA effectiveness.<sup>27</sup>

Only 32% of the MPAs were larger than 20 km<sup>2</sup>, while 27% of them were larger than 30 km<sup>2</sup>. Within most of the countries, fewer than half of MPAs exceeded the 20 km<sup>2</sup> minimum size; only in six countries (France, Germany, Lithuania, Malta, the Netherlands, Romania, and the UK) were median MPA sizes greater than this recommended minimum.

Natura 2000 MPAs also vary in the nature and scope of the protection that they are intended to provide. Of the 3449 areas, 77% were SCIs or SACs and 33% were SPAs (with 361 MPAs designated as both). The SCIs and SACs, which are designated for the protection of non-bird features (both species and habitats), protected a median of two features each (Figure 3), and a maximum

of 11 features (*Baie de Saint-Brieuc – Est* in France, which is intended to protect four species of marine mammals and habitats that include reefs, sandbanks, and submerged caves).<sup>28</sup> In contrast, 636 SCIs and SACs have been designated with the aim of protecting just one feature, with 73 MPAs protecting a single species, and 563 MPAs protecting a single habitat. While some of these ‘single-feature MPAs’ may be small in size, others covered extensive areas. For example, the *Southern North Sea* SAC in the UK, which in 2019 became the largest marine SAC (36 951 km<sup>2</sup>) in the Natura 2000 network, grants protection only to harbour porpoise (*Phocoena phocoena*).<sup>29</sup>

SPAs, on average, were designated on the basis of a higher number of features each: an average of 33 bird species per MPA. Variation in the scope of protected features among sites was marked, with SPAs in ten countries that were designated to protect the habitat of just one bird species, while three countries (Italy, Romania, and Spain) have designated SPAs that are each intended to protect more than 200 bird species.

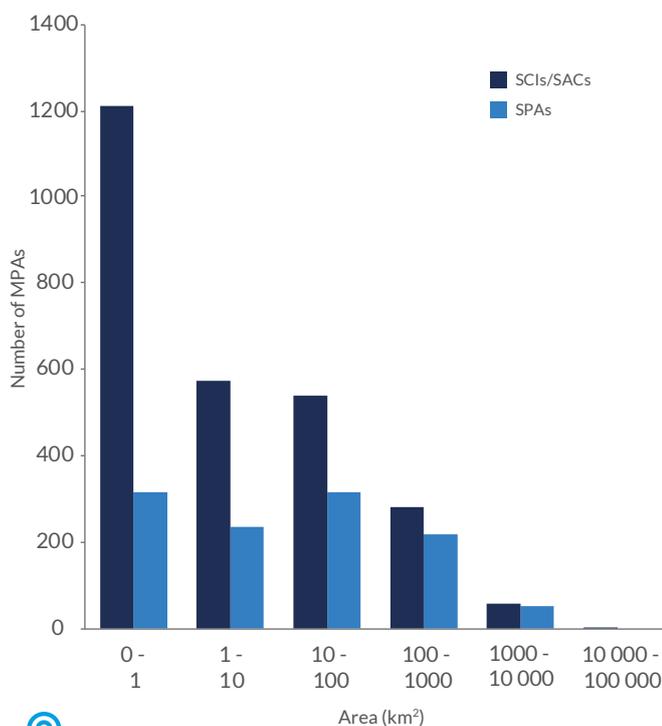


Figure 2. Size distribution of Natura 2000 MPAs, as of the end of 2018. MPAs are shown according to type: Sites of Community Importance (SCIs) and Special Areas of Conservation (SACs), and Special Protection Areas (SPAs).

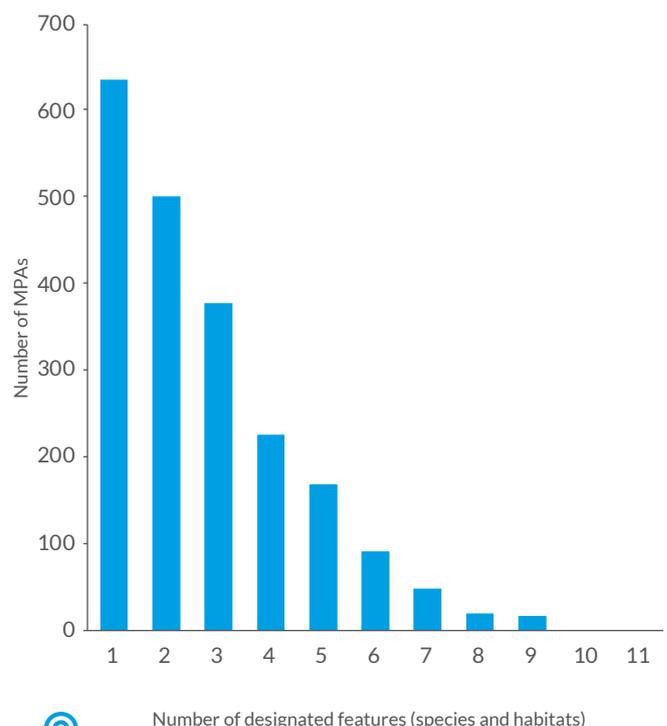


Figure 3. Number of Natura 2000 SCIs and SACs, according to how many features (habitats and species) they are designated to protect.

## 2. Threats: Human activities in European seas

We identified the main human activities that represent direct threats to species and habitats in European seas and which could be mapped. Given the broad geographic scale of the assessment, we focused only on sea-based threats (which can occur directly within the waters of MPAs) rather than land-based threats (such as coastal development or agricultural runoff) or large-scale threats to marine ecosystems (such as climate change).

We selected those threats for which spatial data were available at a European-wide scale. The resulting 13 threats included in our assessment were:

- anchorage areas
- aquaculture farms
- dredge dumping
- dredging
- fishing
- oil and gas boreholes
- oil and gas installations
- maritime traffic
- other platforms
- ports
- submarine cables
- submarine pipelines
- wind farms

For all of the threats above, data used were from 2018. Details of these data and the approaches used to map specific threats are provided in Annex B.

It should be noted that data limitations meant that other threats at sea could not be included in the assessment, even though they may also pose significant risks to MPAs. For example, recreational activities (e.g., boating, swimming, and recreational fishing) rank amongst the highest threats in MPAs in some regions,<sup>18,30</sup> but data were not available at the necessary scale.

## 3. Threats inside European MPAs

We combined the spatial data on Natura 2000 MPAs and threats in European seas, to identify the nature and extent of threats within those MPAs. This analysis was carried out on two levels, as detailed below.

First, we examined the extent of spatial overlap between all 3449 of the Natura 2000 MPAs, and all 13 threats. Given the scale of this analysis, we focused on identifying which threats, and how many threats, occurred within the MPAs. It should be noted that we did not attempt to quantify the potential scale of impacts upon marine features.

Second, we carried out a more focused assessment, in which we assessed the presence of threats specifically within Natura 2000 MPAs (1945 SCIs/SACs) that have been designated (exclusively or in part) for the protection of seabed habitats, under the Habitats Directive. We examined the overlap between those MPAs and the eight threats (from the selection above) that most directly affect the seabed, namely:

- anchorage areas
- dredge dumping
- dredging
- fishing (with high-risk gears for seabed habitats)
- oil and gas boreholes
- oil and gas installations
- submarine cables
- submarine pipelines

For this analysis, we included only fishing activities with those gear-types that are recognised as posing a high risk to the specific habitats for which the MPAs were designated. For details of the approach used to identify high-risk fishing, see Annex B. We considered both the occurrence of high-risk fishing within sites, as well as the intensity of that activity, measured in terms of density of fishing activity (annual hours of fishing activity relative to MPA area).

# THREATS

to marine habitats  
and species

## ANCHORAGE AREAS



Anchor chain in a *Posidonia oceanica* meadow, Spain.  
© OCEANA / Enrique Talledo

## DREDGING



Dredging vessel, Portugal.  
© OCEANA / Gorka Leclercq

## FISHING



Fishing line entangled in corals, Malta.  
OCEANA © LIFE BaHAR for N2K

## OIL AND GAS INSTALLATIONS



Offshore oil platform, Germany.  
© OCEANA / Juan Cuetos

## MARITIME TRAFFIC



Container vessel, Gibraltar, UK.  
© OCEANA / Gorka Leclercq

## SUBMARINE CABLES



Submarine cable with common sea stars (*Asterias rubens*) and algae, Sweden. © OCEANA / Carlos Minguell

## WIND FARMS



Offshore wind farm, Denmark.

# Findings

## 1. A broad-scale look: Threats across Natura 2000 MPAs

Our assessment showed that human activities that pose a potential threat to biodiversity are widespread across the marine Natura 2000 network. Across all 3449 MPAs in the network, 72% of sites (corresponding to 99.93% of the marine Natura 2000 network by area) were affected by at least one of the 13 threats assessed; only 28% of sites (949 MPAs) were not affected by any of the threats. In terms of area, MPAs unaffected by any threats represented only 0.07% of the total network.

Of the 13 threats assessed, the most widespread ones across sites were maritime traffic (in 66% of MPAs), fishing (in 32% of MPAs), and submarine cables (in 26% of MPAs) (Figures 4-7). In contrast, the least common threats were wind farms (in 0.6% of MPAs), oil and gas installations (in 0.6% of MPAs), and other platforms (in 0.3% of MPAs).

However, these threats were still relevant at the local scale, as they were concentrated in a small number of countries.

The pervasiveness of threats inside MPAs was also apparent at the level of individual countries. In all 23 countries, threats were present in more than half of the MPAs. The percentage of sites with threats present ranged from 51% (in Finland) to 100% (in Belgium). Across countries, the main threats observed throughout the network remained prevalent. Maritime traffic affected at least half of the MPAs in all but three countries (Finland, Slovenia, and Sweden), which is not surprising, considering that this threat encompassed traffic from all sorts of vessels, including cargo ships, fishing vessels, passenger vessels, and law enforcement vessels. Fishing activity within MPAs was more variable among countries, ranging from 5% of MPAs in the case of Finland, to 70% of MPAs in Belgium. Noting the wide variation in the total number of designated MPAs per country (Annex A), the countries with the highest absolute numbers of fished sites were Spain (157 MPAs), France (154 MPAs), and the UK (152 MPAs).

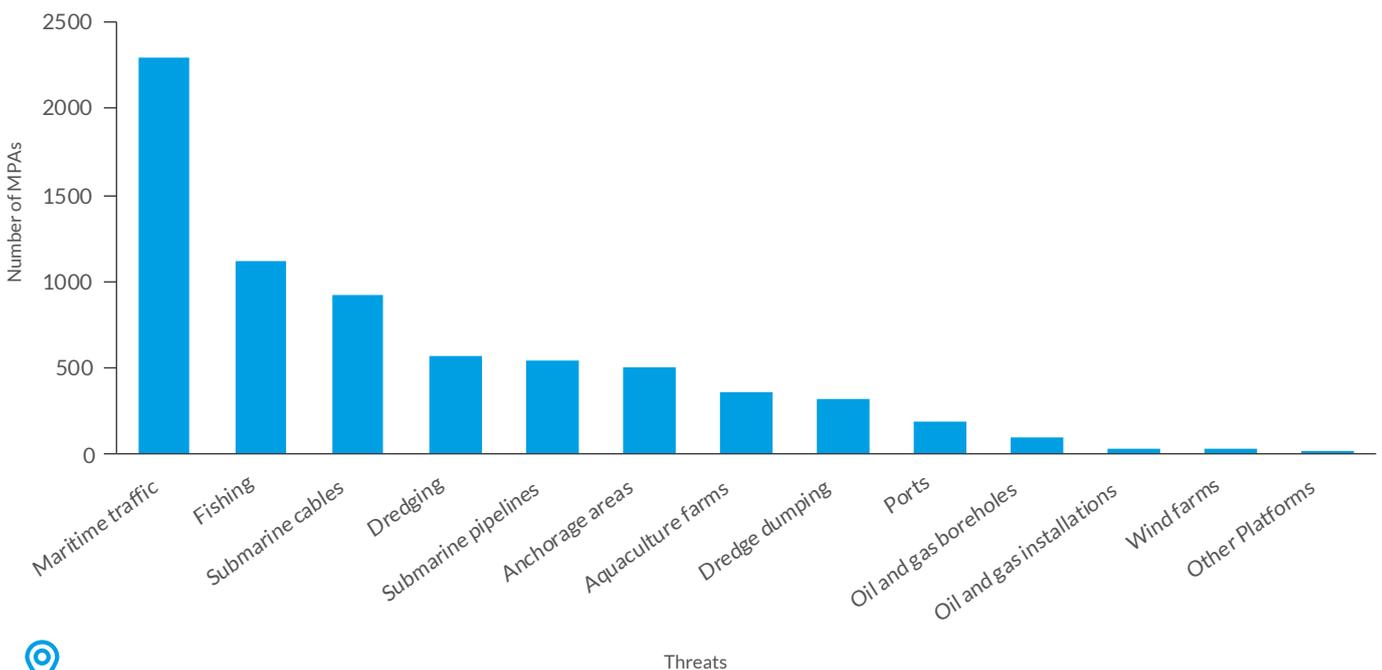


Figure 4. Number of Natura 2000 MPAs affected by each of 13 threats assessed.

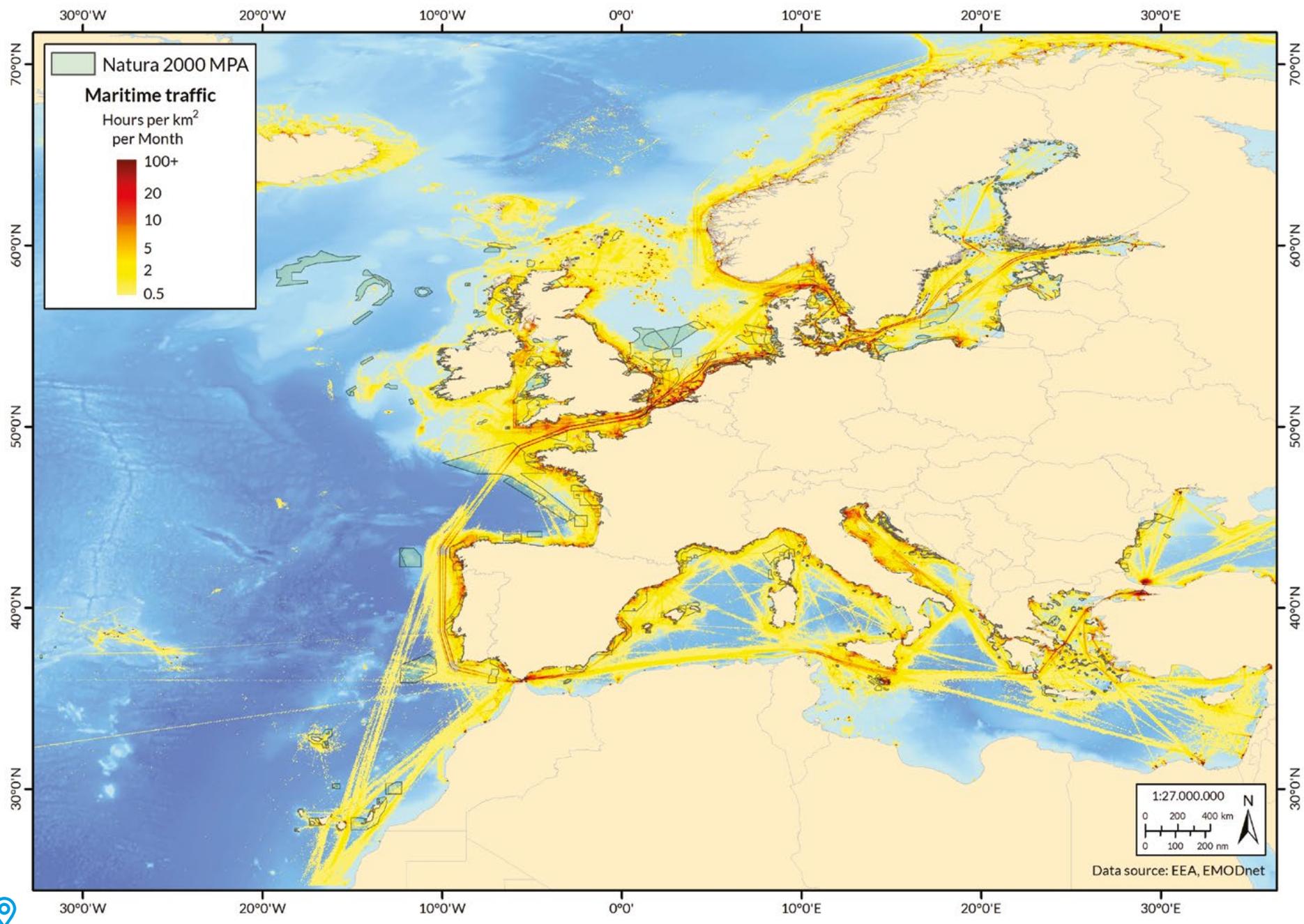


Figure 5. Extent of maritime traffic in European waters in 2018, including within Natura 2000 MPAs (shown as areas outlined in black).

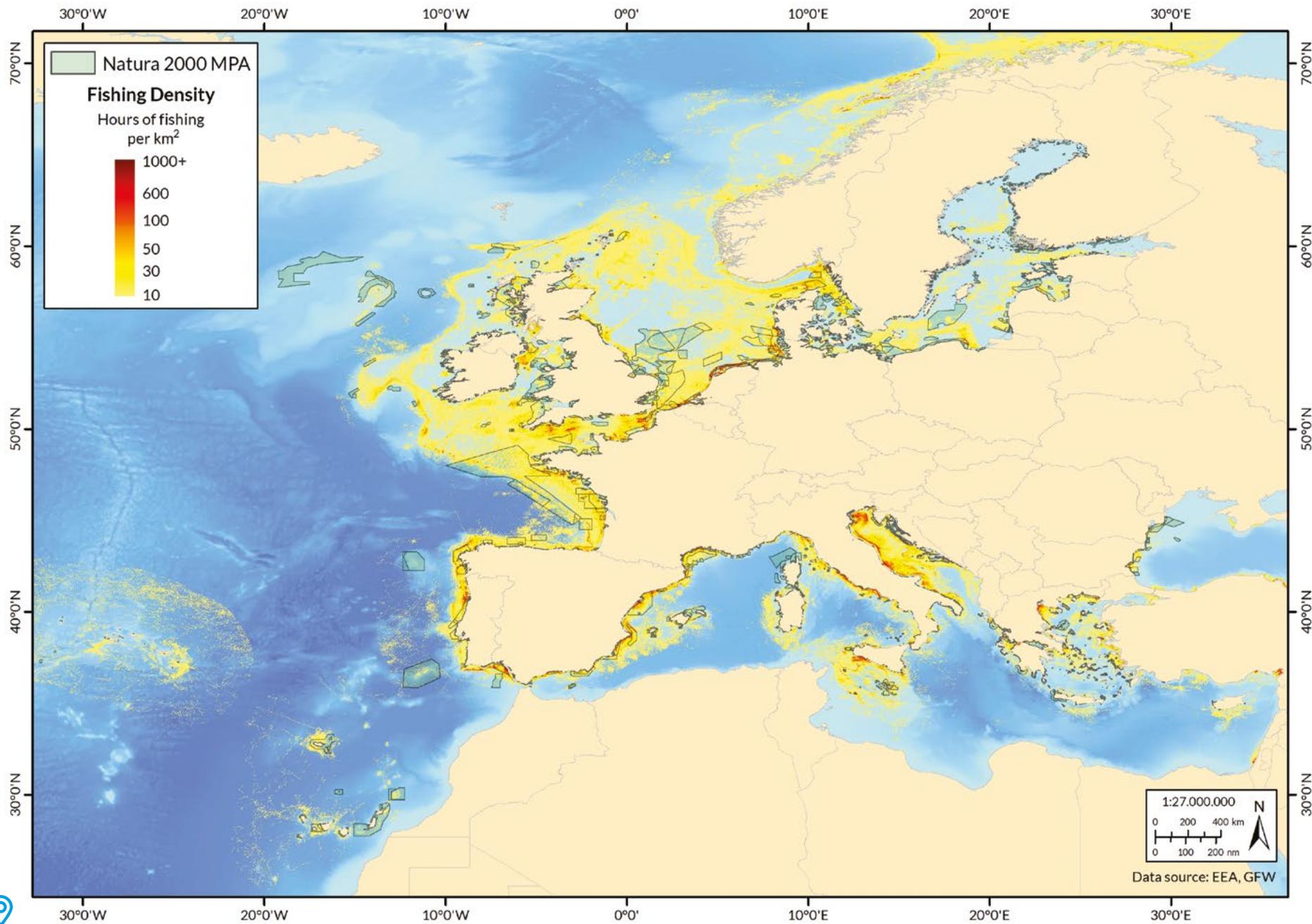


Figure 6. Extent of fishing activities in European waters in 2018, including within Natura 2000 MPAs (shown as areas outlined in black).

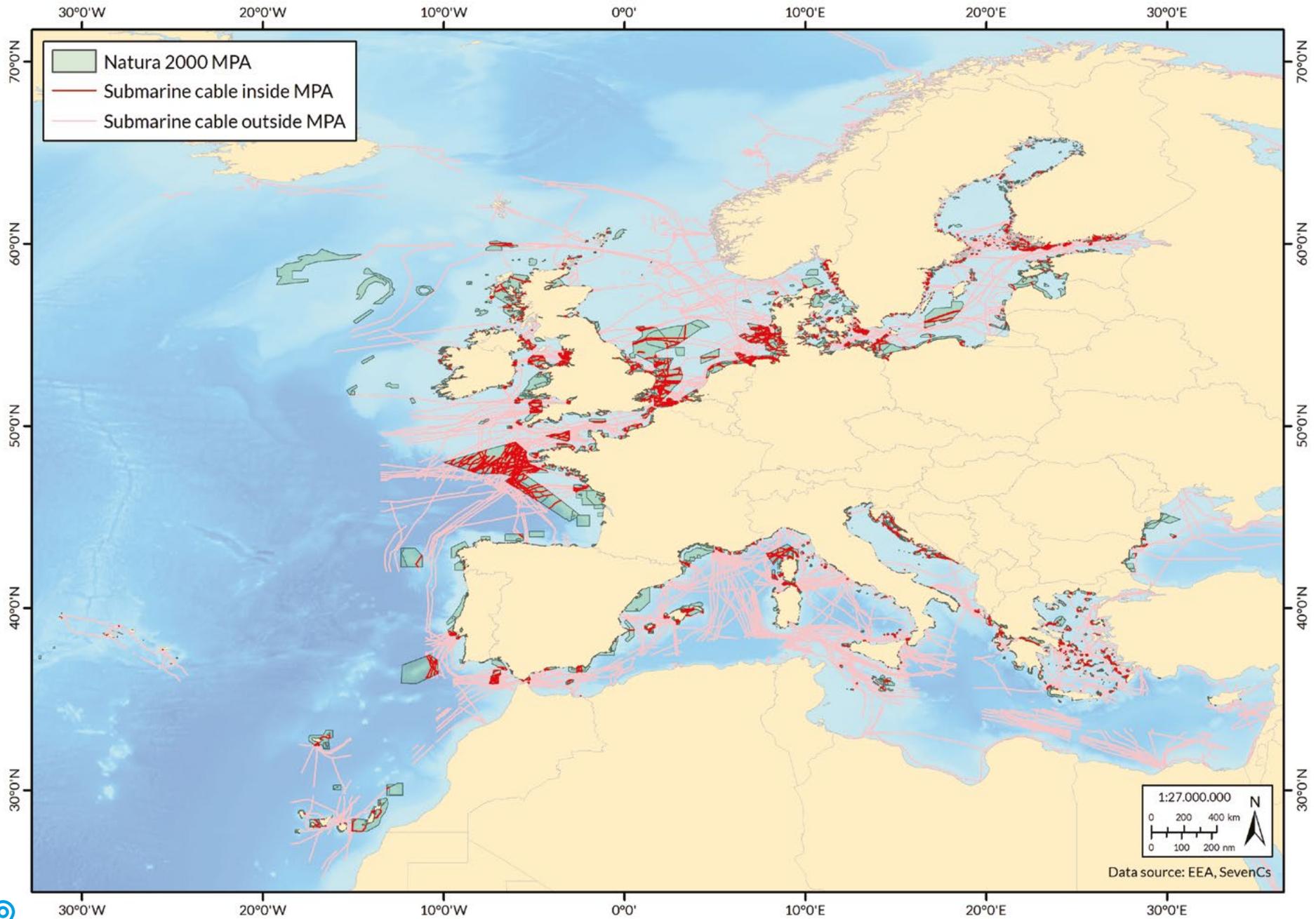


Figure 7. Extent of submarine cables in European waters in 2018, including within Natura 2000 MPAs (shown in red).

Other threats were less common at the scale of the entire network, yet were relevant at the level of specific countries. For example, the 21 MPAs containing wind farms were concentrated in just five countries (Denmark, Germany, Spain, Sweden, and the UK), with the UK alone accounting for half of those sites. Similarly, oil and gas installations were found inside MPAs of six countries (Germany, Italy, Malta, the Netherlands, Spain, and the UK). Boreholes for oil and gas extraction were present within the MPAs of 12 countries, with the highest numbers of affected sites in Italy (19 MPAs), Germany (17 MPAs), and the UK (17 MPAs).

Overall, individual MPAs faced an average of two threats within their boundaries. Numbers of threats per MPA ranged from zero to a maximum of 12 out of the 13 potential threats assessed (Figure 8). Four MPAs faced this highest level of threat: the overlapping *Waddenzee* SAC and SPA in the Netherlands (see Box 2), and *Liverpool Bay* SPA and *Southern North Sea* SAC, both in the UK. An additional three MPAs (in Germany and the UK) were each associated with 11 threats. At the level of individual countries, the average number of threats per MPA ranged from one threat per MPA (in Cyprus, Finland, Slovenia, and Sweden) to four threats per MPA (in Belgium and Germany) (Figure 9).

Not surprisingly, the highest levels of threat were found in MPAs that are adjacent to the coast – where human pressures are generally more intense – while threat levels tended to be lower for sites that are further offshore. Beyond this general distinction, broad spatial patterns were also apparent in MPA threat levels across European seas. MPAs with moderate to high numbers of threats were spread throughout the northeast Atlantic and North Sea, while in the Baltic Sea, higher levels of threat were generally found within MPAs in the Belt Seas and along the southern shore (e.g., Denmark, Germany, Poland, and Estonia). In the Mediterranean and Black Seas, MPAs with high numbers of threats were found along much of the European coast, including large MPAs in France and Spain, and smaller coastal areas in Croatia, France, Greece, Italy, Malta, Romania, and Spain (Box 2).

It is worth noting that the apparent lack of threatened MPAs in certain European regions also reflects the underlying fact that relatively fewer MPAs have been designated in those waters. For example, little area has been designated as protected within Natura 2000 MPAs in the Adriatic Sea (5.8%), the Aegean Sea (2.6%) and Macaronesia (3.3%).<sup>31</sup> Furthermore, the current MPA network is largely composed of small MPAs, located in nearshore and coastal areas. Partly due to their small size, human pressures on those waters do not translate into high apparent threat levels inside MPAs, when mapped at a European scale.



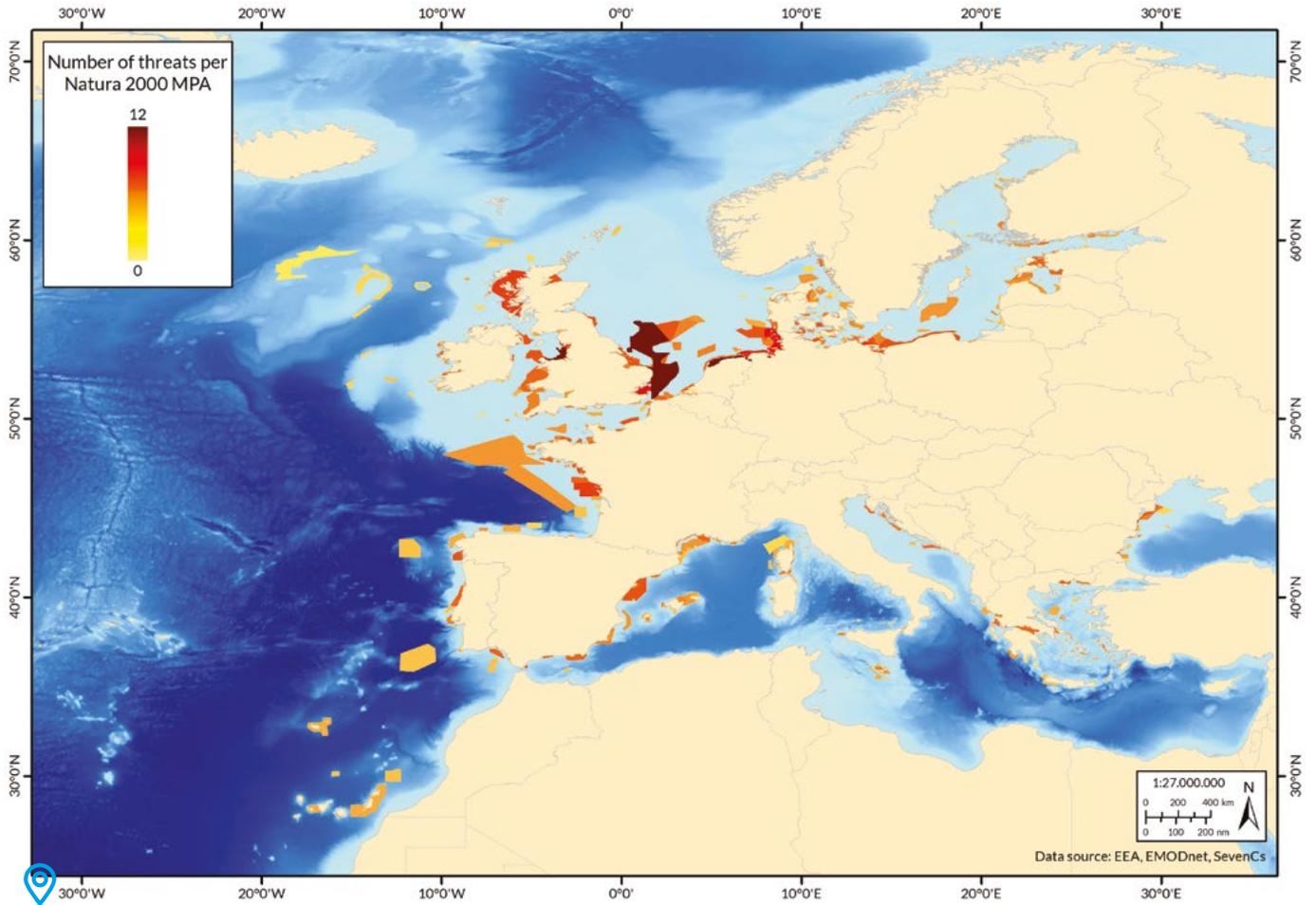


Figure 8.  
Total number of recorded threats per MPA (out of a maximum of 13 threats assessed) in 2018.

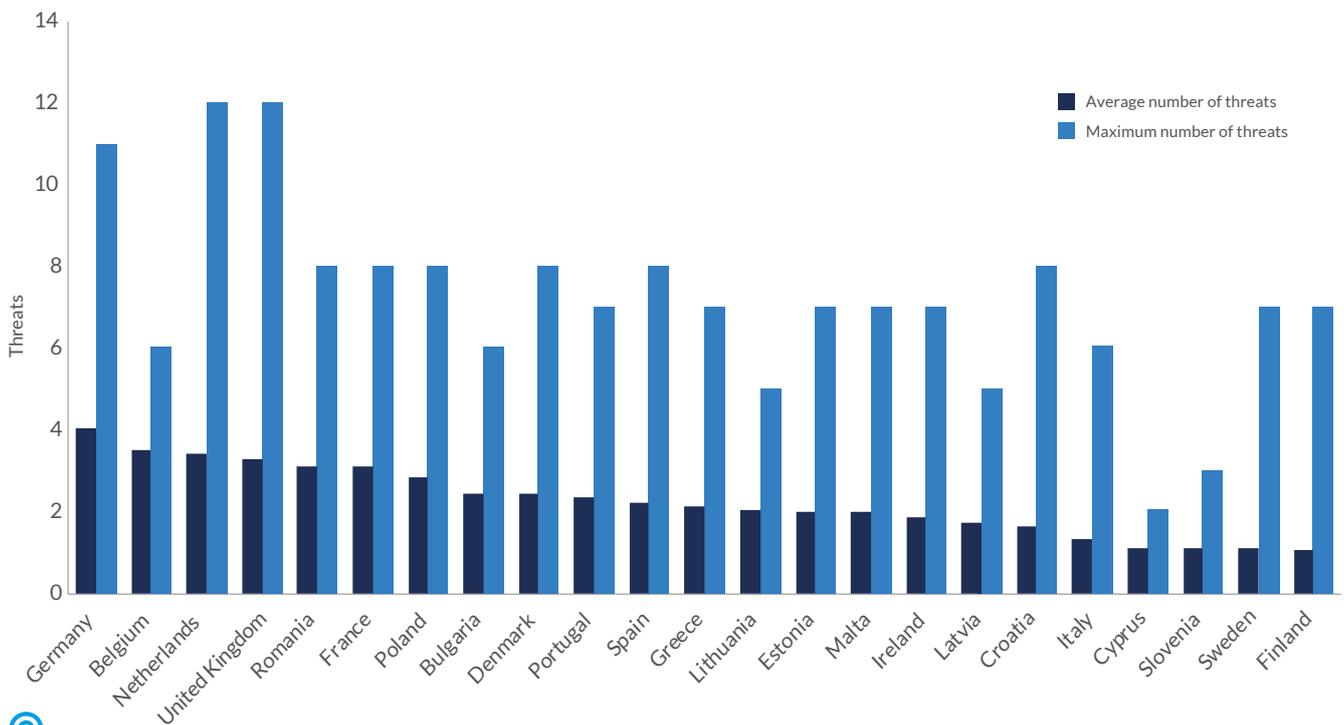


Figure 9.  
Average and maximum number of threats per Natura 2000 MPA, by country, out of a total of 13 threats assessed.

## Box 2.

# Troubled waters: When the multiplication of threats undermines protection of sites

## 1. Waddenzee (Netherlands, North Sea)

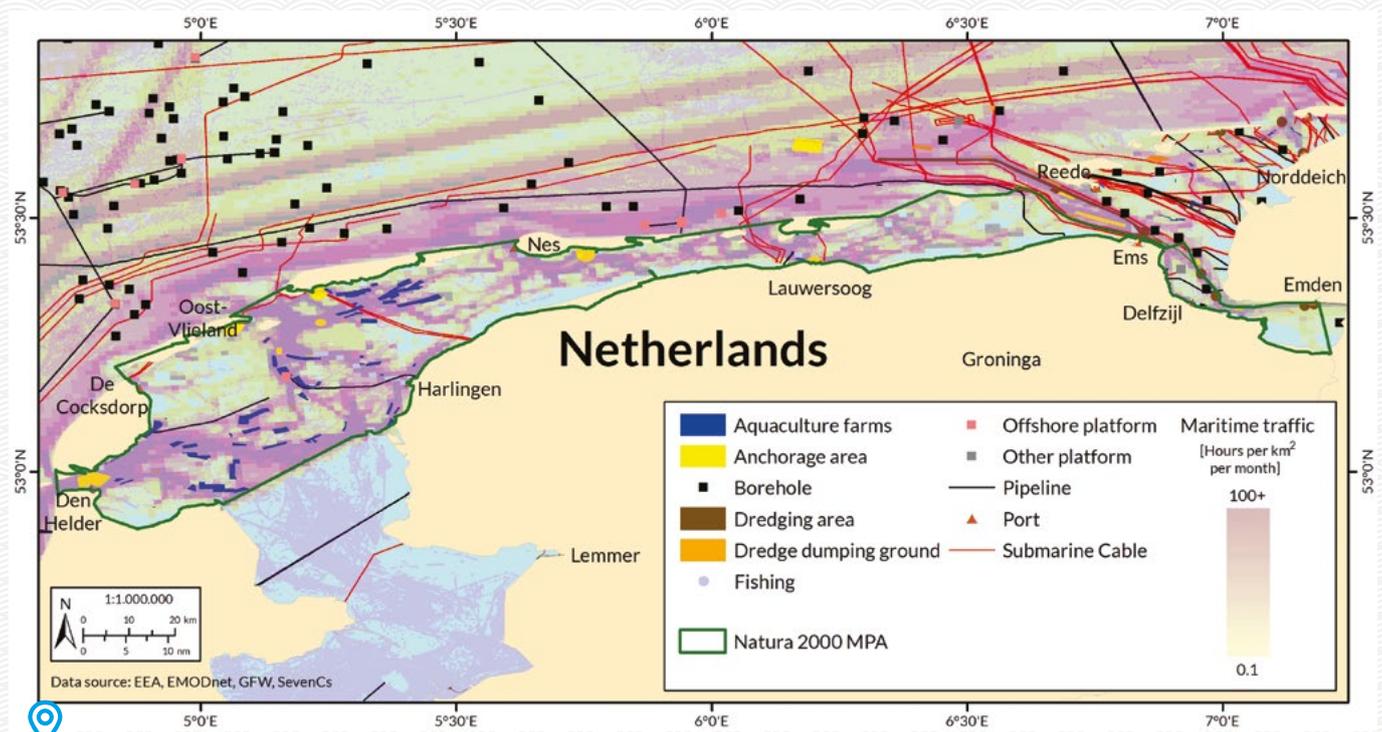
The Wadden Sea is an important wetland and tidal area, located in the southeastern North Sea and home to numerous species of birds, mammals, and fish. The Dutch part of the area was officially designated as a Natura 2000 MPA in 2009 and became one of the largest protected areas in Europe, covering about 2600 km<sup>2</sup>. The area comprises both a Habitats Directive site and a Birds Directive site (both named *Waddenzee*) that aim at protecting coastal and intertidal habitats (such as mudflats and sandbanks); mammals like grey seal, common seal, and harbour porpoise; and about 50 species of wintering birds. In addition, the Wadden Sea has been declared a UNESCO World Heritage site and a Ramsar site.

The North Sea is one of the busiest and most highly disturbed seas in the world, and the Dutch coastal area clearly illustrates this heavy level of human pressure. Many activities are permitted and take place in the

Wadden Sea, to varying extents, such as shipping, gas and oil drilling, fishing, dredging, and various recreational activities.

Our analyses indicated that *Waddenzee* is one of the sites facing the highest number of threats (12) in the entire Natura 2000 marine network. This finding highlights the heavy concentration of economic activities in this region – including inside this large MPA. The main threats detected within the boundaries of *Waddenzee* SAC were: ten anchorage areas, 58 aquaculture areas, 32 dredging areas, 23 dredge dumping areas, 27 pipelines, and four ports. In addition, we estimated an average of 75 457 hours of maritime traffic per km<sup>2</sup>, as well as 92 583 hours of fishing with gears that are known to directly threaten the habitats for which the MPA was designated.

The shallow parts of the Wadden Sea are important fishing grounds for brown shrimp, plaice, sole, and mussels, targeted mostly by bottom-trawlers that land primarily in ports such as Zoutkamp, Lauwersoog, Harlingen and Den Oever.<sup>32</sup> The fisheries are regulated, with licenses and some spatial closures in place.<sup>33</sup>



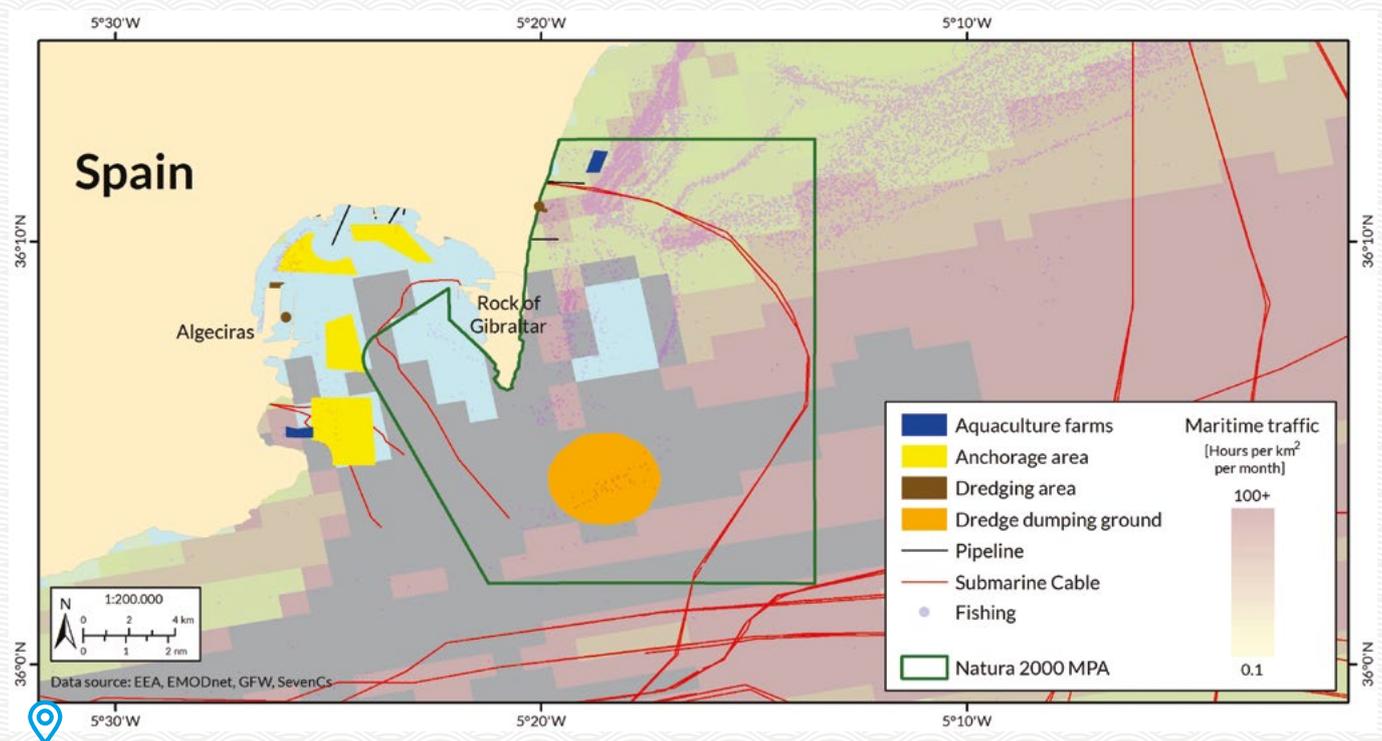
Heavy concentration of human activities inside *Waddenzee* SAC.

The Dutch approach to protecting the designated features within this Natura 2000 MPA raises questions, in light of the high number of activities allowed in the area and resulting threats. This case illustrates an apparent imbalance between the objectives of the MPA, in which the social and economic development objectives largely undermine the nature conservation ones. This is even more of an issue considering that the latest 2020 assessment of the conservation status of Dutch marine habitats found that the status of two of the main habitats within the *Waddenzee* MPA is unfavourable: 'unfavourable-inadequate' for mudflats and sandflats not covered by sea water at low tide and 'unfavourable-bad' for estuaries.<sup>34,35</sup> Our assessment emphasises the clear need for more effective protection of Europe's largest and most important marine wetland, and for a more critical review of the international recognition that has been given – perhaps undeservedly – to this site.

## 2. Estrecho Oriental (Spain, Mediterranean Sea)

The Strait of Gibraltar is the only natural connection between the Atlantic Ocean and the Mediterranean Sea, and is the gateway to the Alboran Sea, a biodiversity hotspot. It harbours a rich diversity of species from both basins, and acts as an important migratory corridor for marine megafauna, such as bluefin tuna, cetaceans, and sea turtles.<sup>36</sup>

The strategic nature of the Strait of Gibraltar has led to the convergence of multiple socioeconomic and geopolitical factors over centuries, and made it a heavily altered area. Resulting impacts on the marine environment include degradation of water quality, habitat alteration, land reclamation, pollution derived from hydrocarbon spills, and the impacts of intense maritime transport.<sup>37</sup>



Documented threats inside *Estrecho Oriental* SAC.

The *Estrecho Oriental* SAC is located in the eastern part of the Strait, surrounding the Rock of Gibraltar. It was designated as a SAC in 2012, for the protection of sandbanks, reefs, submarine structures made by leaking gases, submerged sea caves, and several species of interest, including bottlenose dolphin (*Tursiops truncatus*) and loggerhead turtle (*Caretta caretta*).

Our analysis highlighted the heavy concentration of human activities in this area, with eight different threats recorded within the 236 km<sup>2</sup> area of the MPA. Across the entire Natura 2000 MPA network, *Estrecho Oriental* is subject to one of the highest rates of maritime traffic (over 22 000 hours/km<sup>2</sup>). This is linked to its close proximity to Algeciras, which is ranked as the largest port in Spain and the Mediterranean in terms of cargo transport, and also serves as an international logistics hub for liquid bulks and bunkering and maritime bridgehead providing logistic connections with Africa.<sup>38</sup> This exceptionally dense volume of maritime traffic creates a high risk of ship collisions and resulting fuel

spills, and of direct collisions with migratory megafauna,<sup>36</sup> in addition to an elevated level of underwater noise.<sup>39</sup>

Another significant potential threat is a large area, located almost at the centre of the MPA, for dredge dumping, which may disturb resident fauna by increasing turbidity or altering seabed geomorphology. A mussel longline aquaculture facility is also found inside the SAC. Although this type of system is associated with relatively less severe impacts on the benthos than other types of aquaculture, it could potentially increase levels of suspended sediments within the area.<sup>40</sup>

Fisheries also operate within *Estrecho Oriental*; a fleet that comprises mainly small-scale vessels operates in several fishing grounds, targeting horse mackerel, bluefin tuna, red seabream, swordfish, and several species of bivalves. Data from Global Fishing Watch also indicated the occurrence of bottom-trawling below 50 m depth within the MPA, despite the fact that the management plan expressly prohibits the use of this gear, in order to conserve reef habitats.<sup>41</sup>



## 2. A closer assessment: Threats to protected seabed habitats

Our focused assessment of threats within Natura 2000 MPAs that have been designated for the protection of seabed habitats (n=1945 MPAs) revealed that 55% of these sites (n=1077 MPAs) were associated with one or more of the eight seabed threats assessed (Figure 10). In terms of area, those sites that did not face any of the seabed threats (n=868 MPAs) accounted for only 6.6% of the total area covered by these 1945 MPAs.

At the national level, 16 countries were found to have seabed threats in more than half of their habitat-protecting MPAs. The proportion of sites that faced these threats ranged from 25% of MPAs (in Slovenia) to 100% of MPAs (in Belgium). In terms of absolute numbers of sites with one or more seabed threat, the greatest number of affected sites were in Sweden (142 MPAs), Italy (135 MPAs), France (120 MPAs), and Spain (114 MPAs).

Across all 1945 habitat-protecting MPAs, the average number of seabed threats per site was 1.1. The highest

number of seabed threats per MPA was documented for two MPAs, both in the Wadden Sea, in which all eight assessed threats were present: *NTP S-H Wattenmeer und angrenzende Küstengebiete* SAC in Germany and *Waddenzee* SAC in the Netherlands. Three MPAs (all in Germany) were associated with seven seabed threats each, while 16 MPAs faced six seabed threats each (in the waters of Estonia, France, Germany, Ireland, the Netherlands, Poland, Spain, and the UK).

The most common seabed threats documented, in terms of numbers of sites affected, were submarine cables (in 28% of MPAs) and fishing with gears that pose a high risk to designated habitats (in 26% of MPAs). Of these two threats, fishing is typically recognised as the main pressure on seabed habitats within many European MPAs;<sup>42</sup> the mobile and repeated nature of fishing with high-risk gears causes direct damage to extensive areas of the seabed.

Focusing more closely on fishing pressure revealed the worrying extent of this threat.

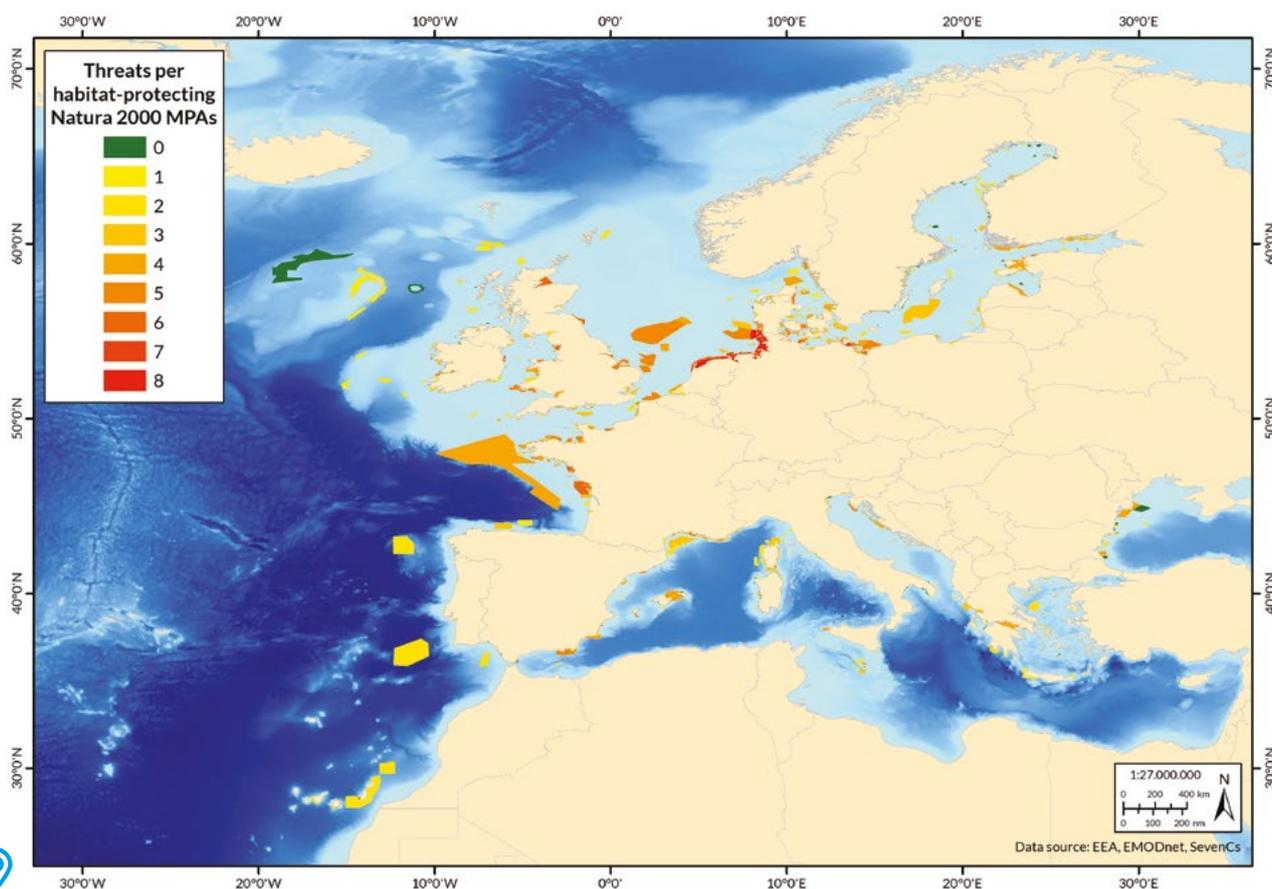


Figure 10. Total number of recorded seabed threats per site inside Natura 2000 MPAs that are designated for the protection of seabed habitats under the Habitats Directive.

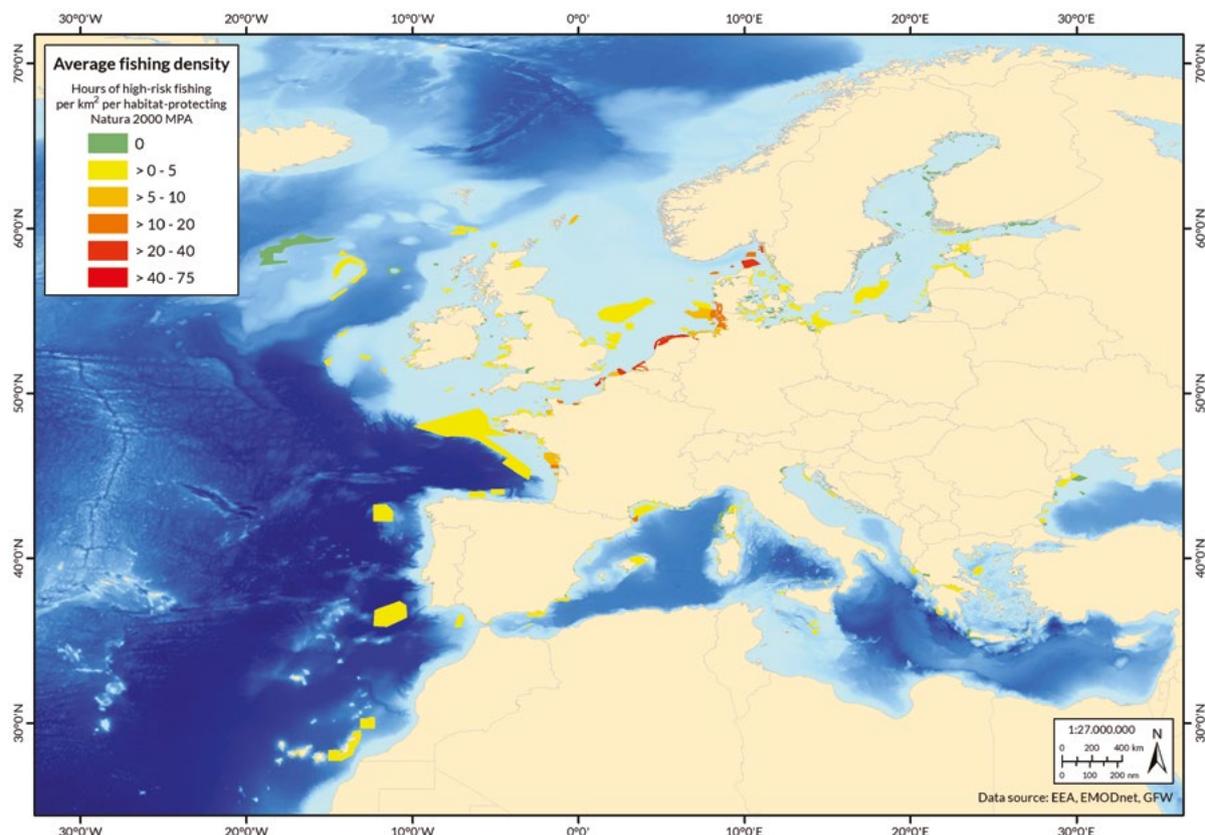
**510 Natura 2000 MPAs that have been designated specifically for the protection of seabed habitats permit fishing activities within their boundaries that are known to damage those very habitats (Figure 11).**

Overall, a relatively small area of the network of habitat-protecting sites is unfished with high-risk gears; only 14% of the 384 000 km<sup>2</sup> of total area designated for habitat protection lies within MPAs that are not subject to fishing activities known to threaten the designated habitats within them. This was related to the fact that almost all of the areas with no high-risk fishing pressure on protected seabed habitats were small, coastal areas, with 86% of these sites covering areas of less than 20 km<sup>2</sup>. One particular MPA stands out on the map as an exception: *Hatton Bank* SCI in the UK spans an area of 15 690 km<sup>2</sup> and has been closed to bottom fishing since 2013.<sup>43</sup>

Examining the density of fishing activities, in terms of annual hours of fishing activity relative to MPA size, revealed areas of particularly heavy fishing pressure on the seabed from high-risk fishing gears (Figure 11).

The highest densities of high-risk fishing were recorded for the Dutch *Noordzeekustzone* SAC (72 h/km<sup>2</sup> annually), followed by the Italian *Fondali di Scilla* SAC (62 h/km<sup>2</sup> annually; Box 3).

Beyond these two specific sites, the highest densities of high-risk fishing on protected habitats were found along the French coast, in the southern North Sea, and in the Skagerrak (Box 3). In the Mediterranean Sea, MPAs subject to the highest densities of high-risk fishing activity comprised small, coastal sites in Italy, and two sites in Spain. In the Baltic Sea, no high-intensity sites were found in the Baltic proper; the only MPAs that experienced more than 5 h/km<sup>2</sup> annually with high-risk gears were in the Kattegat and the Sound. However, it is worth noting that the two regions in European waters with relatively high numbers of small-scale vessels are the Mediterranean and Baltic Seas. Therefore, estimates of threat to seabed habitats from high-risk fishing are likely to be underestimated in those areas, given that the satellite data used to measure fishing activity depend on vessel tracking systems that are not mandatory for small vessels.



**Figure 11.** Average fishing density in 2018 (in hours per km<sup>2</sup>) with high-risk fishing gears inside Natura 2000 MPAs that have been designated for the protection of seabed habitats.

## Box 3.

# A known risk: Damaging fishing over 'protected' habitats

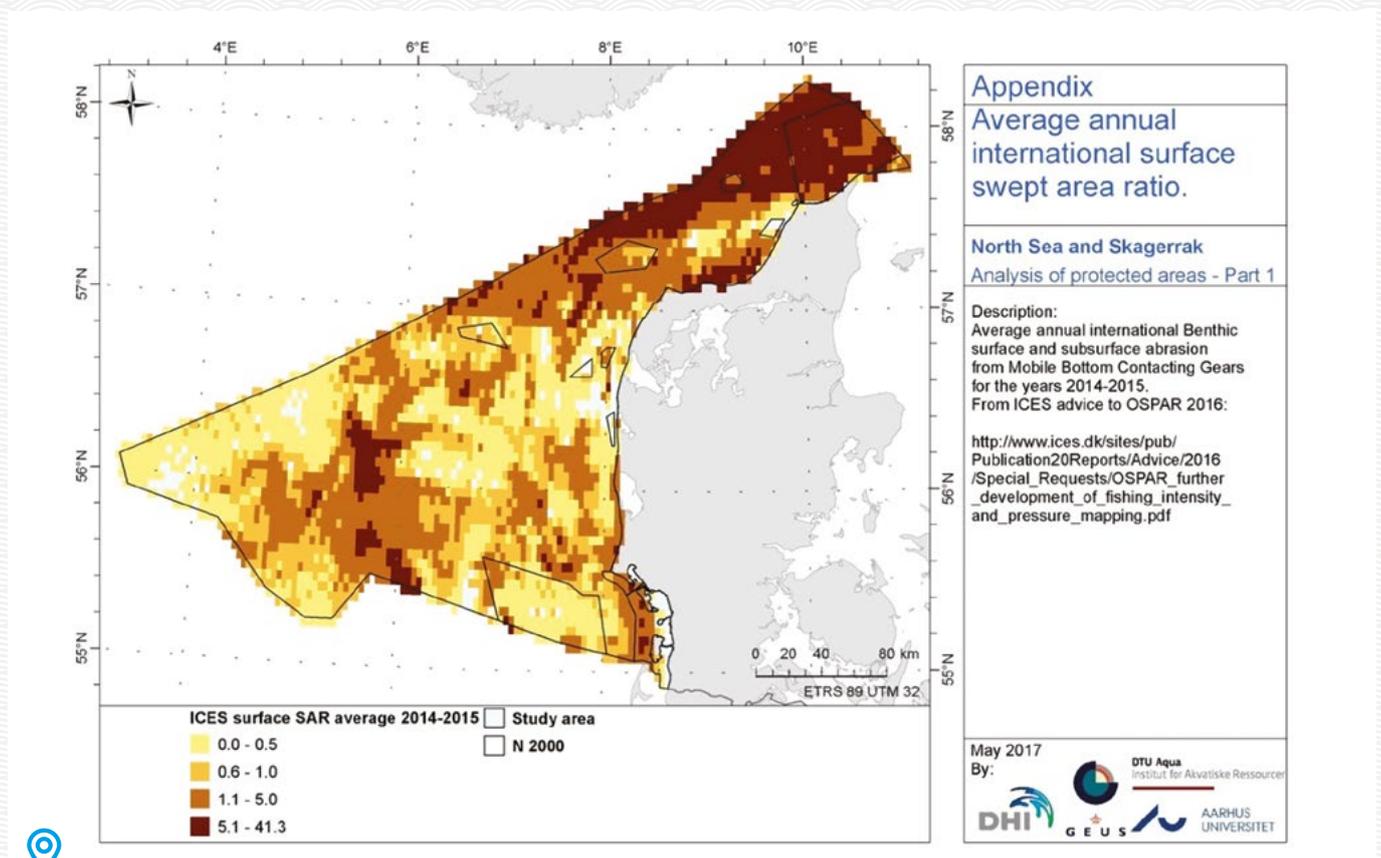
## 1. Skagens Gren og Skagerak (Denmark, the Skagerrak)

Located at the northern tip of Denmark, this large Natura 2000 protected area encompasses approximately 2700 km<sup>2</sup> of marine area. It was designated as a SAC in 2011, and is intended to grant protection to harbour porpoise (which is found in high densities in the area), common seal, and sandbanks, amongst other types of habitats.

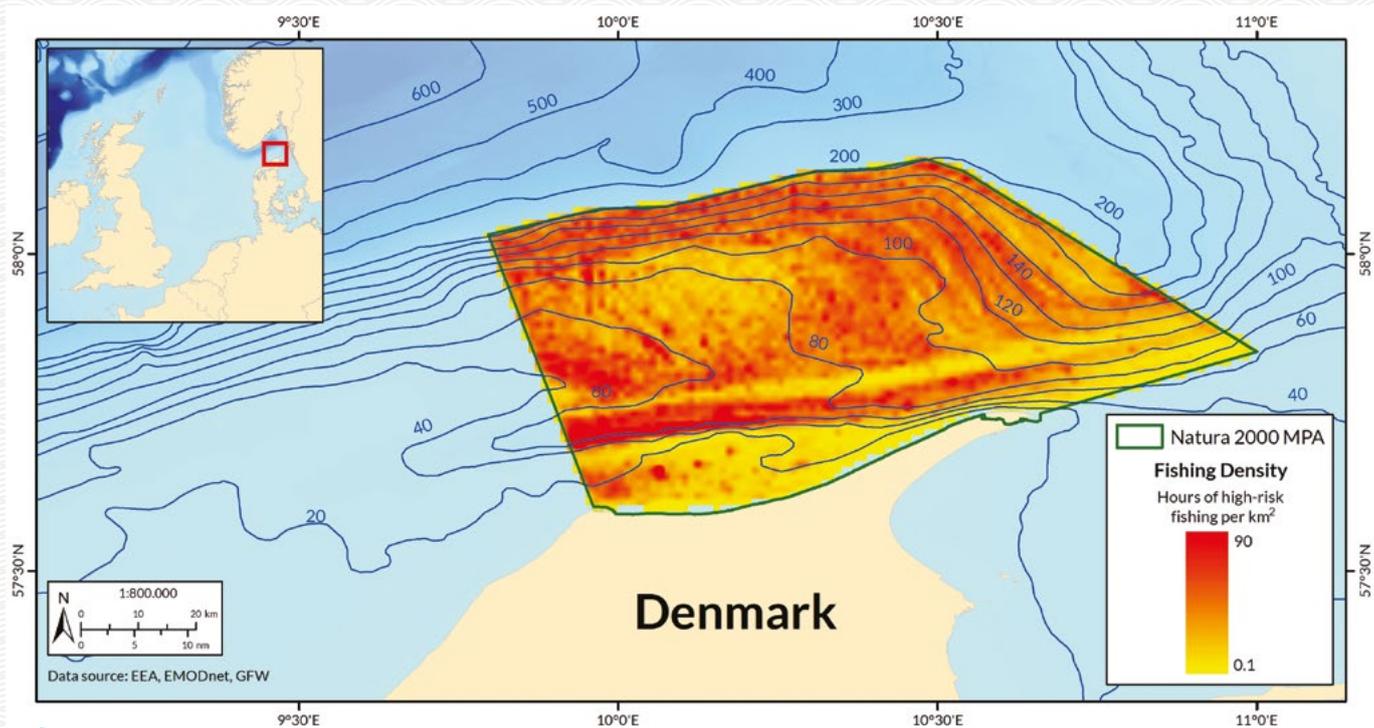
Our analysis of fishing with high-risk gears revealed that this site was amongst the most intensively trawled MPAs in Europe in 2018; more than 63 337 hours of high-risk fishing were carried out within the boundaries of *Skagens Gren og Skagerak* by more than 170 vessels, 90% of which used otter trawls. The site lies within a major fishing ground for the Danish trawling fleet targeting demersal species such as haddock, cod, whiting, plaice, and Norway

lobster. The resulting intensity of pressure from mobile fishing gears on benthic communities in this Natura 2000 MPA is amongst the highest in the entire Danish North Sea.<sup>44</sup>

The Danish government's most recent 'basic analysis' for the site (conducted to underpin the management plan for the period 2022-2027) describes intensive commercial fishing by Danish vessels over 12 metres length that use trawl gear, including beam trawls.<sup>45</sup> It also mentions that the competent fisheries authorities will assess the need to introduce regulation of fishing activities in the area to meet the conservation objectives of the site. The current management plan for the site, however, which covers the period 2016-2021,<sup>46</sup> does not contain any specific actions, timetable, or priority measures clearly targeting the marine environment or fisheries.



Average annual surface disturbance by mobile bottom-contacting fishing gears in the Danish North Sea and Skagerrak during 2014-2015, with the boundaries of Natura 2000 MPAs shown. *Skagens Gren og Skagerak* SAC is the northeasternmost MPA, at the northern tip of Denmark. Source: Edelvang *et al.* 2017.<sup>44</sup>



Annual fishing density in 2018 (in hours of fishing per km<sup>2</sup>) with high-risk gears (i.e., those gears known to directly damage designated seabed habitats inside the MPA) inside *Skagens Gren og Skagerak* SAC.

This case illustrates a negligent approach to MPA management, as it appears that no management of bottom-fishing has been implemented since the designation of the site, despite the very high bottom-trawling intensity described above, and the Danish government's recognition of this threat. Such an MPA delivers very limited – if any – benefits to the seabed habitat it is supposed to protect, as is further underlined by the official 2020 assessment of Danish sandbanks in the Atlantic as having an 'unfavourable-bad' conservation status.<sup>31</sup>

In addition to sandbanks, heavy benthic fishing pressure inside *Skagens Gren og Skagerak* is likely to have damaged other sensitive seabed features that are not officially designated as protected by the site. Surveys in the area by Oceana in 2017 revealed the presence of other ecologically important ecosystems, like sea pen fields and reefs, which are vulnerable to damage from mobile benthic fishing gear. Trawl marks on the seafloor were also visible.<sup>47</sup>

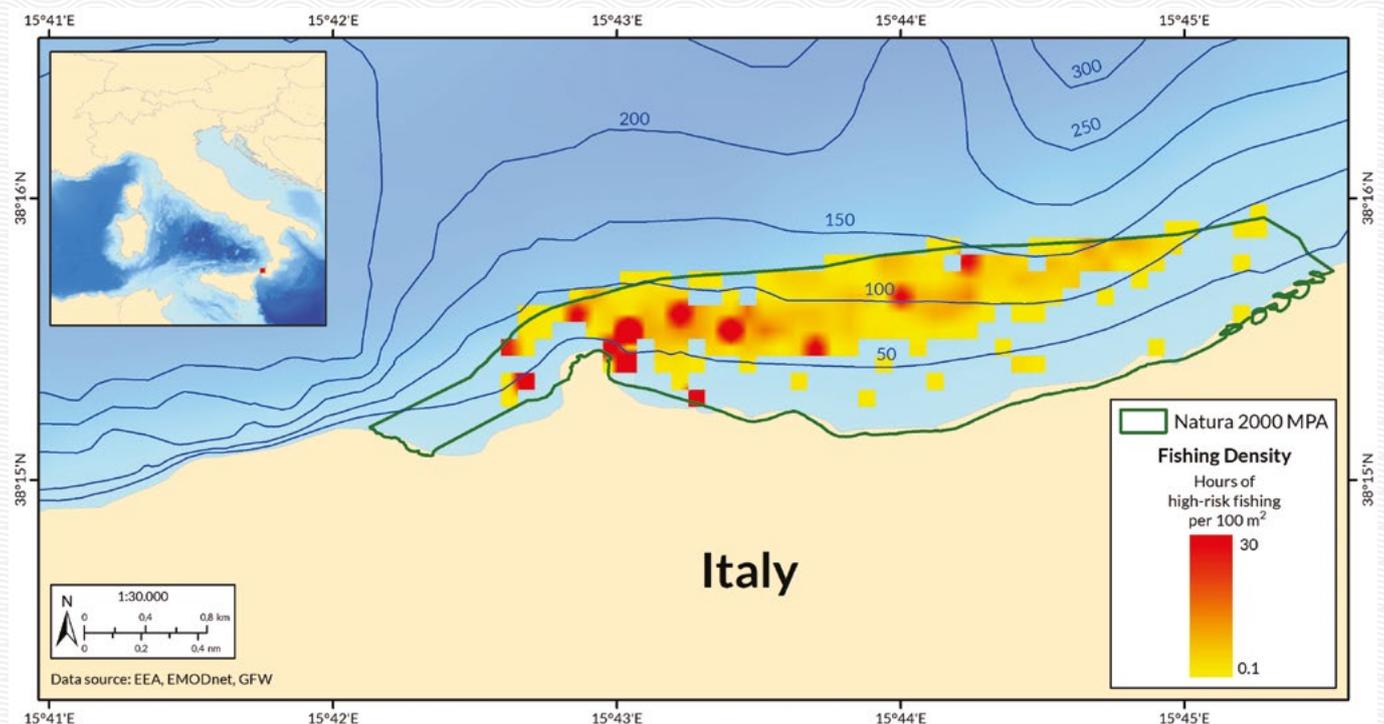
## 2. *Fondali di Scilla* (Italy, Mediterranean Sea)

This small Natura 2000 MPA (3.75 km<sup>2</sup>) is located on the Calabrian coast of Italy (south Tyrrhenian Sea) in the gateway of the Strait of Messina, between mainland Italy and Sicily. It was designated as a SAC in 2017, to protect reefs, *Posidonia* beds, and bottlenose dolphins (*Tursiops truncatus*). The area is dominated by strong currents, and characterised by granite shoals and exposed rocky pinnacles that rise from the seabed.<sup>48</sup> This combination of factors has given rise to reefs that comprise populations of red sea fan (*Paramuricea clavata*), coralligenous communities, and a richness of associated fauna. *Fondali di Scilla* is of particular importance for the rare black coral species *Antipathella subpinnata*, which is protected across the Mediterranean Sea, under the Barcelona Convention.<sup>49</sup> The site is home to one of the most extensive populations of *A. subpinnata* in the entire Mediterranean basin, with a meadow of thousands of colonies mixed with gorgonians, between depths of 50 m and 100 m.<sup>50</sup>

Our analysis revealed that in 2018 this small MPA was subject to the second-highest density of fishing with high-risk gears of all the sites assessed (61.5 h/km<sup>2</sup> annually). According to data from Global Fishing Watch, the few fishing boats operating inside *Fondali di Scilla* used set gillnets and set longlines. These fishing gears pose a recognised threat to reefs, particularly due to the risk of bycatch, entanglement, and other physical damage to corals. Careful fisheries management is therefore required to ensure the favourable conservation status of the site's valuable reefs, as well as the *Posidonia* beds. However, the management plan in place in the Calabrian region does not mention any measures related to the management of this small-scale fishery.<sup>51</sup>

While much attention is often focused on the damaging impacts of mobile benthic fishing gear on seabed habitats, this example illustrates how the intense use of passive fishing gears inside an MPA can also undermine the conservation objectives of a site. The high intensity of fishing pressure in *Fondali di Scilla* further raises concerns about whether fishing may also affect the

broader ecological integrity of the MPA, through impacts on associated species (e.g., in terms of food availability, predator-prey interactions, and other interconnections among ecosystems). Moving from a 'feature-based' approach to a 'whole-site' approach for MPA management is essential for achieving more effective protection of wider ecosystems, processes and functions, and thereby supporting healthy, productive, and resilient marine ecosystems.<sup>22</sup>



Annual fishing density in 2018 (in hours of fishing per km<sup>2</sup>) with high-risk gears (i.e., those gears known to directly damage designated seabed habitats inside the MPA) inside *Fondali di Scilla* SAC.

The threat of high-risk fishing inside MPAs was not equal with respect to different protected habitats. Among the Natura 2000 MPAs designated for seabed protection, the greatest number of MPAs in which high-risk fishing occurred were those that aimed at protecting reefs (n=417 MPAs; see Box 4), followed by sandbanks (n=256 MPAs), and *Posidonia* beds (n=134 MPAs) (Figure 12). Proportionately, the most concerning level of high-risk fishing was observed for sites that are designated to protect submarine structures made by leaking gases, with high-risk fishing occurring inside 70% of MPAs intended to protect this habitat type. These structures are extremely vulnerable to direct physical impacts from fishing gear,<sup>52</sup> which can damage or destroy both the actual structures (i.e., bubbling reefs or pockmarks) and the biological communities associated with them.<sup>53</sup>

It should be noted that we have considered high-risk fishing activities inside MPAs that have been designated for the protection of specific habitats, but that it does not imply that those fishing gears are necessarily being used directly over the habitat types concerned. In some cases, fisheries may be managed through zonation-based approaches that restrict the use of certain gear types within locations where specific features are known to occur. Nevertheless, our findings indicate that there are likely to be many cases where the use of high-risk fishing gears directly contravenes the conservation aims of MPAs, either because fisheries management measures are not in place, or because such measures restrict fishing only in the precise locations where designated features have been mapped, or because other vulnerable features found in sites have not officially been listed as designated features.

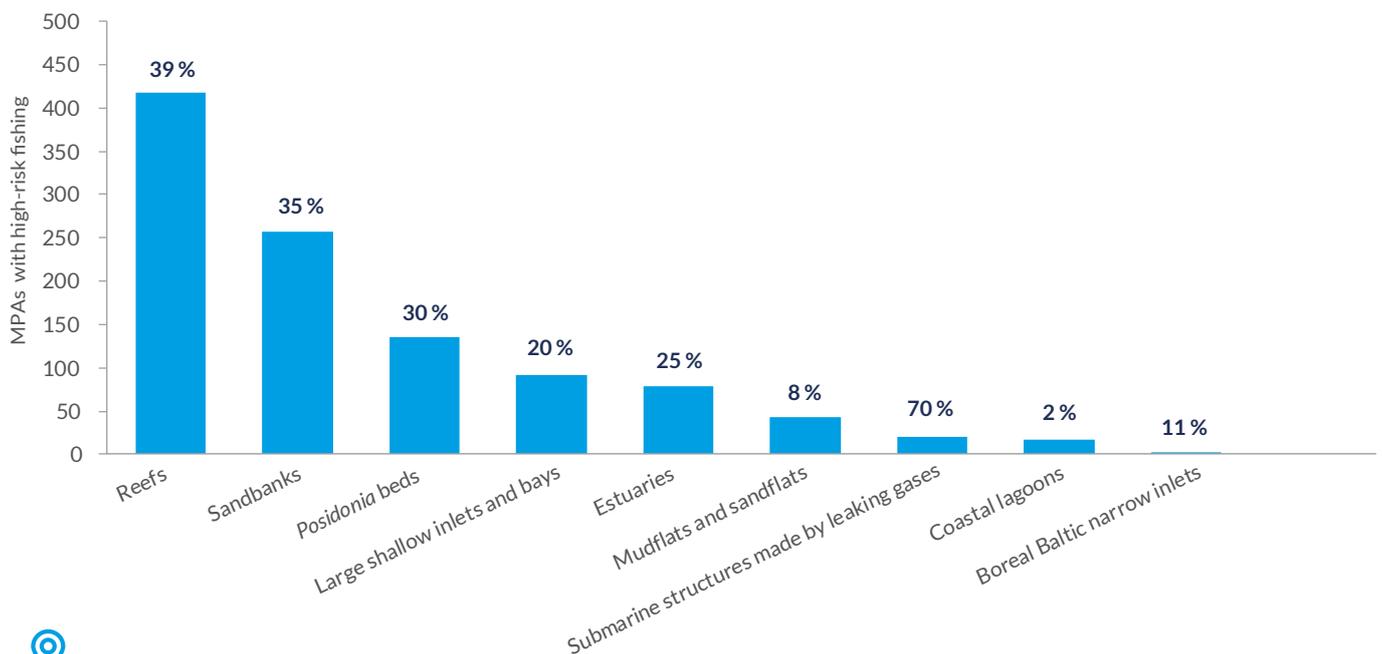


Figure 12.

Number of Natura 2000 MPAs that are designated for habitat protection under the Habitats Directive and are subject to high-risk fishing (i.e., fishing with gear types that are known to damage designated habitats within those MPAs). Percentages over the bars indicate the percentage of all MPAs designated for each habitat type that are subject to high-risk fishing.

## Box 4.

### Reefs: Fragile, threatened, and fished

The Habitats Directive defines reefs as hard compact substrata (mineral or biogenic concretions) on solid and soft bottoms, which arise from the sea floor in the sublittoral and littoral zone.<sup>54</sup> Within this habitat, sub-types of bedrock reef, stony reef and biogenic reef (constructed by various species) are likely to occur. This category comprises a variety of reef types, including cold-water coral reefs, boulder reefs, coralligenous concretions, polychaete (worm) reefs, and mussel beds.

Reefs are often characterised by high levels of biodiversity.<sup>55,56,57,58</sup> They are home to varied benthic communities that – depending on the type of reef and depth – can comprise a wide range of macroalgae and sessile invertebrates, which in turn support a variety of mobile animals, including invertebrates and fishes. These diverse ecosystems provide an array of valuable ecosystem services, including refuge, spawning and nursery areas, and feeding grounds for many associated species, as well as carbon sequestration.<sup>59</sup>

Widely distributed, reefs occur in all of the European marine biogeographical regions (Atlantic, Baltic, Black Sea, Macaronesia, and Mediterranean). Within the Natura 2000 marine network, they represent the habitat type for which the greatest number of sites has been designated: as of the end of 2018, 1078 Natura 2000 MPAs included reefs as a designated feature. Many of these sites are also designated as MPAs under the Regional Sea Conventions (Barcelona Convention, HELCOM, and OSPAR), as part of countries' efforts to fulfil their commitments for the protection of certain reef habitats and species under those international bodies.

Despite the relatively high number of European MPAs designated for reefs in European waters, MPAs do not appear to be effectively safeguarding these ecosystems. Reefs are not considered to be in favourable condition in any of the five marine biogeographic regions: the latest official assessment found that the status of reefs is 'unfavourable-inadequate' in the Atlantic and Black Sea, 'unfavourable-bad' in the Baltic Sea, and 'unknown' in Macaronesia and the Mediterranean.<sup>35</sup>

Their poor status reflects their sensitivity to human pressures, especially those activities that damage or remove reef-building species. Across countries within the Natura 2000 network, "fishing and harvesting of aquatic resources" is the main reported pressure and threat to reef systems, followed by pollution and temperature changes.<sup>35</sup> Our assessment unveils the particular threat posed by fishing, with the finding that reef MPAs were the most exposed to high-risk fishing, despite the known impacts of damaging gears on fragile reef ecosystems.<sup>60</sup>

Without serious restrictions on fishing activity in reef areas, the conservation status of reefs in fished MPAs, and beyond their boundaries, is unlikely to improve. This puts at risk not only the reefs themselves, but also the many ecosystem goods and services that they provide – including providing critical habitat for some of the same species that the fisheries themselves rely upon.



# Management of Natura 2000 MPAs

In considering the state of protection of European MPAs, clearly the nature and extent of threats to biodiversity are only one side of the issue. The other crucial element is management: specifically, the plans and associated measures that, if properly implemented and enforced, determine whether designated MPAs deliver effective protection or remain mere paper parks.

Assessing the quality of MPA management at a network scale is a challenging task, beginning with the fact that publicly reported information is often lacking. The Natura 2000 network is relatively well documented, with a detailed database maintained by the European Environment Agency that provides site-specific information on protected areas, including data on designated features, human impacts, and management.<sup>61</sup> Nevertheless, gaps and inconsistencies remain in the data reported by national authorities in each EU Member State, who do not follow a uniform approach in reporting the categories of management approaches.<sup>62</sup> In its 2015 assessment of the European MPA network, the EEA noted that there was “no simple way to evaluate management effort and success at EU level”, on the basis of the available reported information.<sup>62</sup>

As a result, assessments of management within the Natura 2000 marine network are still at an early stage. A recent (2019) EU-wide assessment focused on whether designated MPAs (including but not limited to Natura 2000 sites) had management plans, as an indication of whether designated MPAs had taken an initial step towards real protection.<sup>13</sup>

Here, we take a complementary approach and ask, for a selection of sites: **Where management plans or measures are in place, are they sufficient to address the scale of threats facing marine habitats and species inside Natura 2000 MPAs?**

## Methods

Given the aim of our assessment and the lack of standardised data on management measures across Natura 2000 MPAs, we took a pragmatic approach and focused on a selection of Natura 2000 MPAs. Specifically, from our dataset of 3449 Natura 2000 MPAs as of the end of 2018 (see *Sites: MPAs within the Natura 2000 network*), we selected the largest Special Area of Conservation (SAC) and the largest Special Protection Area (SPA) from each of the 23 countries within the marine Natura 2000 network. We focused on these sites for two main reasons. First, given their large size, these sites were more likely to encompass threats within their boundaries than smaller MPAs, and therefore provided an opportunity for assessing whether management addressed such threats. Second, larger sites count disproportionately towards the total marine area that countries report as being protected; therefore, the management – or lack thereof – in these sites carries a greater impact.

For countries for which the details on the designation of SACs were not complete in the EEA database, we sought additional information from local authorities and experts. However, in the case of three countries (Croatia, Lithuania, and Romania), it was not possible to resolve these details. Therefore, SACs from those countries were not included in the assessment.

The final set of MPAs assessed included 43 Natura 2000 sites (listed in Annex C), of which 20 were SACs and 23 were SPAs. These MPAs represented a mix of inshore, offshore, and inshore/offshore sites. Our analysis was based primarily on the information included in the most recent (2019) versions of the Natura 2000 standard data forms (SDFs), and the sources referenced therein. The SDFs contain the key site-specific data submitted to the European Commission by national authorities, and are available through the EEA's *Natura 2000 Network Viewer*.<sup>63</sup> These forms provide useful information on management plans, with links to related official documents, and on protection under additional designation types. We also drew on additional relevant documentation available online, and direct consultation with local authorities and experts.

Our assessment followed a criteria-based approach, in which we considered five key aspects of MPA management plans for the selected sites. Specifically, we asked:

1. Are there clear conservation objectives?
2. Are the main designated features addressed?
3. Are the main threats addressed?
4. Are there clear deadlines for measures?
5. Are there provisions for surveillance and monitoring?

Under the Birds and Habitats Directives, conservation measures to safeguard designated features are required for both SPAs and SACs.<sup>64</sup> Such measures are typically developed within the framework of a management plan, whether for individual sites or groups of sites. However, these plans can take a variety of formats. For the purposes of our assessment, we use the term 'management plan' broadly, to include both management plans and other official tools and plans that serve a similar purpose.

This assessment was not intended to provide an exhaustive evaluation of management within the sites. Instead, we aimed to provide an illustrative overview of the management approaches that are currently in place for the Natura 2000 network of MPAs, and to assess whether the plans and measures – if properly implemented and enforced – are likely to result in effective protection at sea.

## Findings

According to the information reported in the SDFs for the 43 MPAs assessed, as of early 2019, management plans were in place for 21 sites. However, while the reported information for one MPA (*Hoburgs bank och Midsjöbankarna* SPA in Sweden) indicated that a management plan existed, this appeared to be an error; no management plan was found at the link provided, or from an exhaustive online search. Additional recent documentation further supported this conclusion.<sup>65,66</sup> For our assessment, we consequently included this site among the MPAs without a reported management plan.

Therefore, according to the official information reported by countries to the European Commission, management plans were in place for 20 of the 43 MPAs in our assessment. The proportion of sites (47% of MPAs) with reported management plans in place was slightly higher than for the entire network of 3449 Natura 2000 MPAs, for which such plans were reported to exist for 42% of sites.

No plans were reported for the remaining 23 MPAs in our selection, suggesting that many of these sites may have lacked the basic framework for effective management. In at least three cases, other management plans and measures were in fact in place, but had not been reported by countries to the European Commission (see *Sites without reported management plans*). However, it was beyond the scope of this assessment to carry out a comprehensive search for management plans in those cases where none had been officially reported.

## Sites with reported management plans

Of the 20 MPAs for which management plans were reported, 12 sites were SACs and eight were SPAs. Management plans existed for both of the assessed sites in seven countries (Belgium, Cyprus, Denmark, Estonia, Finland, Germany, and Romania). In six countries (Latvia, Malta, Portugal, Slovenia, Spain, and Sweden) a management plan was reported for only one of the assessed MPAs, while no management plans were reported in the SDFs for the MPAs assessed in ten countries (Bulgaria, Croatia, Greece, France, Ireland, Italy, Lithuania, Netherlands, Poland, and the UK).

### Timing of management implementation

Under the Habitats Directive, countries are required to avoid the deterioration of designated features from the moment that a site is confirmed as a Site of Community Interest (SCI). The Directive also establishes a six-year deadline by which SCIs must be designated as SACs, with the necessary conservation measures (including management plans, if needed) to ensure the conservation of the sites in the face of threats that affect the area.

Of the 20 SACs included in our selection of sites, only 59% were designated (as SACs) within the required six-year period. For those 12 SACs with reported management plans, these plans were implemented at the time of SAC designation in only six cases. In the other sites, between two and six years passed after SAC designation before management plans were put in place.

The Birds Directive also mandates the implementation of conservation measures to ensure the survival and reproduction of listed bird species. However, in contrast with the Habitats Directive, no deadline is established. This underlying difference was apparent in the timeline of management for the SPAs included in our assessment. Of the 23 SPAs assessed, only eight had reported management plans, none of which were implemented at the moment the sites were designated. Instead, between two and 11 years passed between designation and implementation of management for these MPAs, with an average of nearly nine years.

The lack of management measures for such an extended period of time is clearly cause for concern, considering the risk that this implies for the deterioration of the sites and the species that depend on them.

### Types of plans

The 20 management plans that we assessed fell within two broad categories: 16 plans that were specifically developed for the management of Natura 2000 sites, and four plans with measures that were not specifically designed to comply with the Natura 2000 network requirements.

Management plans that are designed specifically for Natura 2000 areas can target one or more sites. Most such Natura 2000-specific plans included in our assessment were designed for the management of a single Natura 2000 site, such as the Estonian SPA and SAC *Väinamere*, and *Ilhas Desertas* SAC in Portugal. However, several sites were included within management plans covering groups of Natura 2000 sites, such as *Akrotirio Aspro - Petra Romiou* SAC in Cyprus, which is managed under the same plan as 20 other Natura 2000 sites,<sup>67</sup> and the Belgian *Vlaamse Banken* SAC and *SBZ 2/ ZPS 2* SPA, which fall within the same plan as all other Natura 2000 sites in the Belgian North Sea.<sup>68</sup>

Management plans that are not specific to Natura 2000 MPAs are those designed to manage other categories of protected areas, such as national parks, marine reserves, and other types of MPAs. These additional protected sites overlap completely or partially with Natura 2000 MPAs, and have typically been designated prior to the designation of sites within the Natura 2000 Network. Consequently, areas under multiple designations can be covered by multiple management plans. Most (25) of the 43 MPAs we assessed overlapped with other types of protected sites, and four of them had management plans in place that had been designed for those other types of protection, but were reported as also applying to the Natura 2000 MPA. These sites included *Saaristomeri* SAC in Finland, which is designated as a national park, and the *Arcipelago delle Egadi - area marina e terrestre* SPA in Italy, which is a marine reserve.

## **Content of management plans**

Overall, the management plans we assessed were broadly incomplete; only four of them were considered comprehensive enough to lay a foundation for effective management. Specifically, *El Cachucho* SAC in Spain, *Marea Neagră* SPA in Romania, and *Väinamere* SAC and SPA in Estonia were the sites with more complete management plans in place. In most other cases, plans were characterised by a lack of specific measures and deadlines to address all of the features for which the MPAs had been designated or all of the threats impacting the sites. The details of our assessment are presented below, according to the five criteria applied, and are summarised in Figure 13.

### **1. Are there clear conservation objectives?**

Conservation objectives were detailed in nearly all (18 of 20) of the management plans. In general, the plans assessed provided a good overview of the aims of the sites and the features for which they had been designated, and listed sound conservation objectives. However, most plans failed to align each of these objectives with specific measures that would be needed to achieve them.

### **2. Are the main designated features addressed?**

The features for which MPAs were designated were addressed in only 13 of the 20 management plans assessed. In some SACs, certain habitats that had been designated for protection were not subject to any specific management measures (such as sandbanks in *Rigas lica rietumu piekraste* SAC in Latvia or reefs in *Gotska Sandön-Salvorev* in Sweden). Among the SPAs, not all of the bird species covered by the designation were targeted by conservation measures for sites (such as in *Arcipelago delle Egadi - area marina e terrestre* SPA, in Italy). In SPAs with both terrestrial and marine components (e.g., *Akrotirio Aspro - Petra Romiou* in Cyprus and *Saaristomeri* in Finland), measures focused on terrestrial areas but overlooked the marine part of the site.

### **3. Are the main threats addressed?**

Our assessment showed that the main threats impacting the areas – and listed in the management plans – were not always managed, with only nine of 20 sites considered to have properly considered them all. The primary threats that were found to not be addressed were fishing (such as in *Skagens Grens og Skagerak* SAC in Denmark and *Arcipelago delle Egadi - area marina e terrestre* SPA in Italy); marine traffic (such as in *Gotska Sandön-Salvorev* SAC in Sweden); and seabed dredging (such as in *Rigas lica rietumu piekraste* SAC in Latvia). The failure to explicitly respond to such threats with targeted management measures represents an obvious barrier to the conservation success of MPAs.

At the same time, management plans for at least half of the MPAs included general prohibitions on specific activities (such as bans on fishing, shipping or industrial activities), which allow for all features within those sites to be granted protection. These broad bans were variously applied, either to entire protected sites or partially, in cases where zoning had been established.

As with the inclusion of features, the assessed SPA management plans were found to be weak with respect to at-sea measures. This was particularly the case in sites that included both terrestrial and marine areas, where measures aimed at avoiding harm to birds tended to focus on terrestrial areas. Where at-sea measures did exist, they were not always complete in terms of covering all the main types of threats that could affect bird species when at sea, such as fishing, tourism, and pollution.

### **4. Are there clear deadlines for measures?**

Only nine of the 20 assessed management plans clearly established deadlines for the implementation of measures. Deadlines are vital for ensuring that measures are put in place and objectives achieved with no delay. As mentioned previously (see *Timing*), many Natura 2000 sites remain effectively unmanaged for extended periods of time prior to the development of a management plan. Allowing further delays through a failure to establish clear timelines can put the conservation status of MPAs at even greater risk of deterioration.

## 5. Are there provisions for surveillance and monitoring?

Surveillance and monitoring measures were included within 12 of the 20 management plans assessed. Such measures are critical to guarantee the long-term effectiveness of MPAs. Site surveillance contributes to stronger enforcement of management regulations, while monitoring is necessary to determine how well an MPA safeguards the features it is intended to protect, over time. Data gathered provide a scientific basis to inform adaptive management, allowing for the adoption or adaptation of measures in response to detected ecosystem changes.

## Sites without reported management plans

According to the information provided by countries to the European Commission, management plans did not exist for 53% of the 43 MPAs included in our assessment (eight SACs and 15 SPAs), despite the fact that conservation measures were legally required.

According to the reported information, Bulgaria, France, Greece, Ireland, Italy, Netherlands, Poland, and the UK appeared to be delayed in the implementation of conservation measures for SACs. Management of SPAs appeared to be lacking in Bulgaria, Croatia, France, Greece, Ireland, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden and UK.

In some cases, the lack of a reported management plan appeared to indicate that management measures were indeed absent. For example, the oldest SAC in our selection, *Ethniko Thalassio Parko Alonnisou - Voreion Sporadon*, *Anatoliki Skopelos* (in Greece) was designated as an SCI in 2006, and as a SAC in 2011.

However, as of early 2019, the site was still pending the implementation of conservation measures to ensure the protection for sandbanks, *Posidonia* meadows, reefs, submerged caves, monk seals, and bottlenose dolphins. This worrying situation is more broadly representative of Greek MPAs, where the lack of MPA management plans is a recognised problem.<sup>69</sup>

For this site, and three others for which no management plans were reported, such plans were apparently in preparation. The Greek government indicated that plans were under development for both of the Greek MPAs in our assessment, while the Polish government stated that plans were being prepared for *Zatoka Pomorska* SPA. However, details of the expected timelines for completion or measures for inclusion in those plans were not known. A management plan is also currently being prepared for *Dogger Bank* SAC in the UK, an offshore site where fishing impacts on sandbank habitat have long been a concern. The two options currently being considered are either a total ban on damaging gear types activities within the site, or a reduction of fishing pressure, through zoned management and/or limiting fishing with high-risk gears.<sup>70</sup>

For one site that reportedly lacked a management plan (*Kompleks Kaliakra* SAC in Bulgaria), some management measures were nevertheless in place, which had been established under the designation order for the MPA. The implementation of measures to manage specific threats, from the very first moment that an MPA is designated, is a useful approach for ensuring stronger and more effective protection of the habitats and species present. It should be noted that designation orders for other sites in the assessment may also have included specific management provisions, but assessing these laws was beyond the scope of our analysis.



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In at least two cases, MPAs fell within the scope of management plans or measures that had not been officially reported to the European Commission by national authorities. *Pertuis Charentais* SAC (in France) and *Isola di Capraia - area terrestre e marina* SAC (in Italy) both had management plans that were developed for other types of protected areas that overlapped these sites: *Parc naturel marin de l'estuaire de la Gironde et de la mer des Pertuis* in France, and the *Parco Nazionale Arcipelago Toscano* in Italy. In the case of *Isola di Capraia*, a second management plan covers the site (together with other Natura 2000 areas);<sup>71</sup> however, the existence of this plan was not reported in the official data, and so it was not included in our assessment. One additional MPA established measures more recently than the official data used for our assessment. A statutory instrument for *River Shannon and River Fergus Estuaries* SPA (in Ireland) established conservation objectives and measures to manage the site,<sup>72</sup> more than 20 years after it was designated as an SPA.

Finally, it should be noted that both sites with and without management plans may be affected by broader management measures, which have been established on a regional, national, or international scale. Such measures can include those established under EU law (such as the Marine Strategy Framework Directive or the Common Fisheries Policy), national measures (such as Programmes of Measures under the Marine Strategy Framework Directive), the Regional Sea Conventions, transboundary plans for specific areas (such as the Wadden Sea Plan), or management plans for specific threatened species. Such measures applied to at least four of the sites for which management plans reportedly did not exist. *South East Rockall Bank* SAC in Ireland was affected by the EU prohibition on trawling below 800 metres depth,<sup>73</sup> while *Outer Thames Estuary* SPA in the UK was subject to fishing restrictions to protect red-throated diver (*Gavia stellata*).<sup>74</sup> In the Netherlands, *Doggersbank* SAC and *Friese Front* SPA both fell within the scope of the *Integraal Beheerplan Noordzee 2015*, which includes measures on certain activities such as shipping, oil and gas extraction, and dredging.<sup>75</sup>

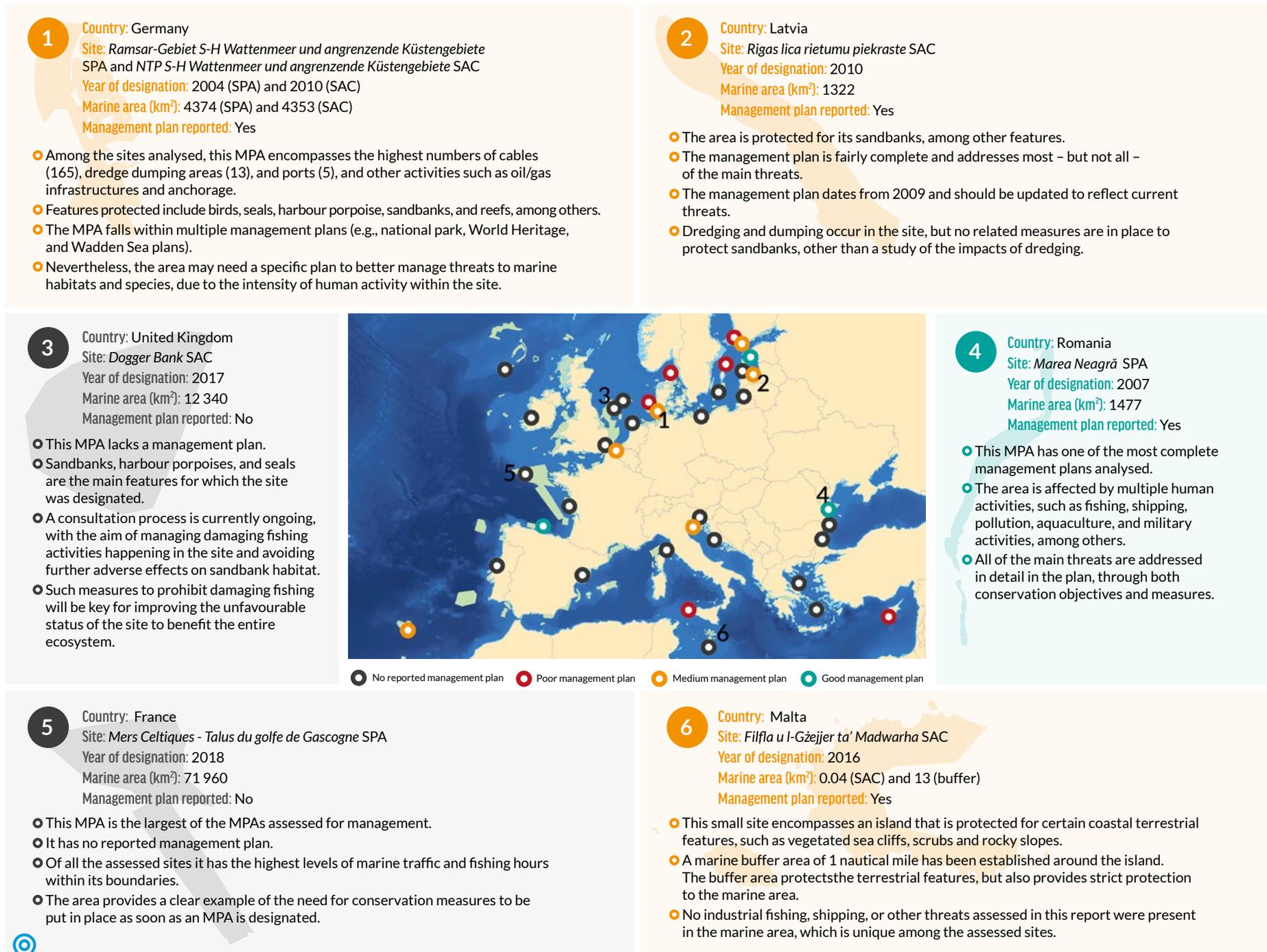


Figure 13.

Summary of management plan assessment, for a selection of 43 Natura 2000 MPAs. Sites selected were the largest SACs and SPAs in each country of the Natura 2000 MPA network, as of the end of 2018. Management plans are categorised according to criteria detailed in the report, with examples of the management scenario in six MPAs.

# Conclusions and recommendations

## for delivering real protection to MPAs

### Synthesis of findings

As the EU and the UK look ahead to the post-2020 global biodiversity framework, and have committed to further expand their MPA networks to 30%, an important question remains: how truly protected are those MPAs that have already been designated in European waters? Our analysis has shed light on this question by assessing two critical aspects of marine spatial protection: the nature and extent of human activities inside MPAs that put biodiversity at risk, and the plans and measures that are in place to safeguard MPAs in the face of those activities.

Our analysis of threats across the 3449 marine Natura 2000 MPAs in EU and UK waters revealed a troubling picture. Nearly three-quarters of sites were affected by one or more of the 13 threats assessed, and those that were not affected represented a mere 0.07% of the total area of the Natura 2000 MPA network. At the national level, threats were present in more than half of the MPAs in each of the 23 countries, ranging from 51% of MPAs in Finland to 100% of MPAs in Belgium. The most widespread threats were maritime traffic and fishing, affecting 66% and 32% of MPAs, respectively. Across the entire network, MPAs faced an average of two threats, with some sites in Germany, the Netherlands, and UK facing eleven or more threats each.

The North Sea appeared to be a clear hotspot of intense threats within MPAs. This finding reflects two aspects of the MPA network in that region: heavy and overlapping pressures on marine ecosystems, and the fact that the North Sea MPA network is more developed and complete than in other areas of Europe. Conversely, the apparent lack of threats inside MPAs in areas such as the Adriatic

Sea and the Western Mediterranean Sea are partly due to a relative lack of MPAs in those areas, with MPA designation lagging far behind other regions.

Focusing on the 1945 Natura 2000 MPAs that have been designated under the Habitats Directive specifically for the protection of seabed habitats exposed the extent to which theoretically protected habitats face direct threats. More than half of the 1945 sites were subject to one or more seabed threats, while MPAs with six or even eight (out of a maximum of eight) seabed threats were documented in the waters of eight countries across the Atlantic and Baltic.

Fishing is a recognised major threat within European MPAs, particularly high-risk fishing: the use of gears that are known to damage protected seabed habitats. More than 500 Natura 2000 MPAs designated for protecting seabed habitats permitted fishing activities known to damage those very habitats. Moreover, the extent of high-risk fishing was so great that only 14% of the total area designated for habitat protection lies within MPAs that were unfished with high-risk gears. This high level of damaging fishing pressure is in line with other research that has shown higher trawling intensities inside EU MPAs than outside their boundaries.<sup>16</sup> In terms of numbers of sites, high-risk fishing was particularly prevalent within MPAs that are intended to protect reefs, sandbanks, and *Posidonia* beds; proportionately, the use of high-risk gears inside 70% of sites designated for the protection of submarine structures made by leaking gases is of particular concern, given the fragility of this habitat type.

Our assessment of MPA management for a selection of the largest MPAs, by country, indicated that management plans or equivalent measures were reported to exist for only 47% of the sites we assessed, based on the official

information reported by countries to the European Commission. No plans were reported for many sites, which raises concerns about a pervasive lack of basic management. When examined, those management plans that were in place were found to be generally incomplete.

Despite establishing clear conservation objectives, most of the assessed plans were characterised by several clear weaknesses: a lack of deadlines for implementing measures; a failure to manage specific features for which sites were designated; a failure to address major threats that put them at risk (like fishing or dredging); and the absence of provisions for surveillance and monitoring, both of which are critical for effective management.

Our assessment also revealed serious delays in the adoption of management measures. Forty percent of the SACs in our assessment were not designated within the six-year legal timeframe. Where management plans existed, they were often late, leaving MPAs without management for up to six years following their designation as SACs. Such extended delays clearly compromise the effectiveness of MPAs. To prevent such situations, one promising approach identified during our assessment was the introduction of conservation measures directly within the designation orders for sites, such that basic management applies immediately from the moment of designation.

## Implications for marine policy

Our assessment revealed that only a small proportion of Natura 2000 MPAs, covering only a minute area, are effectively protected from the vast array of human threats to marine biodiversity, and therefore many sites are unlikely to deliver their intended conservation benefits. While the Natura 2000 network is meant to balance conservation and sustainable use, our analyses indicate that the overall balance is skewed, with human interests prioritised over nature. The current network of European MPAs is not well-managed and evidently not restrictive enough to limit increasing pressures, uses and human activities that affect the marine environment.

This situation is partly explained by a 'race to MPA designation' to meet European and international targets, which has sacrificed quality for quantity and put undue emphasis on designation, rather than on the effective protection that those targets aimed to achieve. The ambition to achieve real protection is too low, and many MPAs aim just for the 'legal minimum' protection instead of what would be needed based on science – or even common sense. Many sites protect only a few features – in hundreds of cases just one habitat or species – creating a situation in which damaging activities are deemed acceptable inside MPAs as long as they do not affect those specific features. This minimalistic feature-based management approach found in most countries is unlikely to deliver wider ecosystem recovery.

The latest *State of Nature* report shows that Europe's nature is in serious and continuing decline and that protected habitats and species are not in good conservation status.<sup>33</sup> For marine biodiversity, weak or absent management in most European MPAs is clearly a major contributing factor. The European Court of Auditors also found that European MPAs provide limited real protection of marine biodiversity, and that provisions to coordinate fisheries policy with environmental policy have not worked as intended.<sup>76</sup> These damning indictments of failure to prevent the degradation and decline of marine habitats and species *inside* MPAs must spur urgent corrective action.



Our findings help to better understand and quantitatively estimate the scale of the problem of European marine 'paper parks', while also illustrating the structural failures and weaknesses of current MPA management approaches in Europe. If most MPAs are under intense pressure, including from destructive, extractive, and industrial activities, is this not fundamentally incompatible with the concept of protected areas?

In 2016, the IUCN adopted a Recommendation that called on governments to prohibit environmentally damaging industrial activities and infrastructure development in all IUCN categories of protected areas.<sup>77</sup> In 2018, an IUCN synthesis on Applying Global Conservation Standards to MPAs recognised that “*any industrial activities and infrastructural developments (e.g., mining, industrial fishing, oil and gas extraction) are not compatible with MPAs*”.<sup>78</sup> From that perspective, the many European MPAs with industrial and extractive threats within their boundaries should not be considered MPAs at all. Following that approach and reviewing our results, if we exclude all those Natura 2000 MPAs that were affected by at least one industrial activity or infrastructural development from the 3449 sites, only 46% of the sites (n=1589) would qualify as actual MPAs.<sup>79</sup> **In terms of area, these 'real' MPAs represent a mere 4% of the total area of the Natura 2000 marine network, implying that a striking 96% of the network (by area) is not protective enough.**

**If we extrapolate this finding to the current European MPA network, assuming that the Natura 2000 sites (which comprise 70% of the network) are broadly representative, it suggests that only 0.5% of European seas are protected within real MPAs – far less than the 10% target for 2020, let alone the 30% target for 2030.**

Excluding extractive and industrial activities from a protected area would seem to be the minimum requirement for protection. In that context it is striking to see some European MPAs with high intensities of extractive and industrial threats being recognised

internationally as exceptional marine areas under international instruments such as the UNESCO World Heritage List. This prestigious label is meant to apply to “Our Crown Jewels of the Ocean”<sup>80</sup> – yet it lists the Wadden Sea, for example, which our analysis shows to be subject to a multitude of damaging activities.

The documented level of threats inside Natura 2000 MPAs raises questions about the very essence of MPAs in Europe, and also the political communication around them. The overriding emphasis on MPA designation – rather than effective protection – has contributed to governments and the European Commission making misleading claims about achievement, based essentially on designated but unmanaged areas. The current Natura 2000 timeline for SAC designation further contributes to this distorted focus on designation, rather than implementation: by allowing up to six years for adopting conservation measures, a default situation of delayed management is created, establishing a window of time during which a minimal approach is often followed at the expense of the effective conservation of sites.

The EEA, in its *Marine Messages II* report, offers a worrying perspective, noting that “*the EU maritime economy is expected to double by 2030 in the light of the EU's 'blue economy' objectives, leading to increased competition for marine natural capital by maritime sectors*”.<sup>1</sup> A radical change is needed to ensure strict levels of protection and management of European MPAs and to alleviate human pressures, if we want MPAs to contribute to halting the degradation and depletion of marine ecosystem capital.

With the biodiversity crisis high on the European political agenda, Oceana urges the European Commission, EU Member States, and the UK to significantly step-up efforts to manage their MPAs, deliver proper protection and restrict the most impacting human activities. The Natura 2000 network is meant to ensure the long-term survival of Europe's most valuable and threatened species. To successfully deliver nature conservation, European MPAs must have 'teeth', especially in a degraded marine environment facing significant and increasing anthropogenic pressures, including climate change, population growth, coastal development, and pollution.

In May 2020, the European Commission presented the EU 2030 Biodiversity Strategy,<sup>10</sup> which included a commitment to develop a new EU Action Plan to conserve fisheries resources and protect marine ecosystems by 2021. This Action Plan will aim at limiting the use of fishing gear most harmful to biodiversity, including on the seabed. This initiative represents a key opportunity to tackle one of the main threats to marine biodiversity identified in this analysis: the extent of damaging fishing gears inside European MPAs.

Specifically, Oceana issues the following recommendations:

- The European Commission should **investigate why EU Member States have failed to deliver ‘favourable conservation status’** of marine habitats, based on the 2020 *State of Nature* report,<sup>33</sup> especially for countries with vast Natura 2000 sites where these habitats are theoretically protected. It should **open systematic infringement procedures** against EU Member States that have failed to adopt adequate management measures for their Natura 2000 sites.
- The official reporting, counting and celebrating of an MPA is often done at the designation date, when the MPA is, by definition, a paper park. The United Kingdom, EU Member States and the European Commission should **only count an MPA against international targets once the site is actively managed**. This would create an incentive for the UK and for EU Member States to adopt and implement early management so they can report their MPAs to the relevant international bodies (including Regional Sea Conventions such as OSPAR or global agreements such as the CBD). This would correspond to the approach suggested in the *MPA Guide*.<sup>6</sup> Factoring in the stage of establishment of an MPA is key, as this process is not always linear or unidirectional, and biodiversity is not safeguarded within an MPA until the MPA is implemented, enforced, and actively managed.<sup>6</sup>
- **Precautionary measures for the most impacting pressures should be put in place from Day 1 of MPA designation**. Specifically, the national administrative orders designating a site should systematically establish minimum management measures immediately, for instance by listing prohibited activities and usages (e.g., specific fishing gears).
- EU countries and the UK should **follow a ‘whole-site approach’ to management of MPAs, by shifting away from ‘feature-based’ management to the protection of wider ecosystems processes and functions**. This corresponds to best practice in MPA management, especially in relation to fisheries, where wide restrictions are put in place for high-risk fishing gears that directly contravene the conservation aims of sites. The current minimal approach to management leads to spatial restrictions being put in place only in the exact locations where designated features have been mapped, disregarding the wider ecological interconnections within MPAs.<sup>21,22</sup>
- The European Commission, EU Member States, and the UK should **prohibit destructive fishing gears inside MPAs that threaten the very features sites are designated for, as they are intrinsically incompatible with MPA objectives**. Site-specific management has had limited success and has been too slow to deliver effective conservation. In the case of high-risk fishing activities, like bottom-trawling, a general ban instead of site-level ones is more effective and will ensure consistency, as well as facilitate monitoring and enforcement.
- The European Commission, as the competent authority for adopting management measures related to the Common Fisheries Policy (CFP), should adopt a policy **to reject any joint recommendation submitted under Article 11 of that regulation that allows destructive fishing gears to be used inside MPAs**. Similarly, **the UK government should prohibit bottom-fishing in its offshore MPAs**, now that it is no longer bound by the rules of the CFP.
- The European Commission should **focus its upcoming 2021 EU Action Plan to conserve fisheries resources and protect marine ecosystems on tackling the damaging impacts of bottom-trawling on seabed biodiversity, and enact a ban on bottom-trawling in all EU MPAs**, as well as restrictions on bottom-trawling in vulnerable areas, such as coastal waters.

Similarly, the Commission should also identify and take action to prohibit other specific threats that are incompatible with the protection of marine features inside all EU MPAs.

- The European Commission should **adopt an EU-wide ban on offshore hydrocarbon exploitation and exploration activities** in and around MPAs. In order to meet its carbon-neutral commitment<sup>81</sup> and to address the current climate crisis, the EU must decarbonise its economy, starting by phasing out the production of offshore hydrocarbons. That also means strictly prohibiting the authorisation of these polluting and risky activities inside and around MPAs.<sup>82</sup>
- **The EU and the UK should drastically increase the level of protection inside MPAs.** The EU has committed to increasing strictly protected MPAs to 10% of its marine area in the next 10 years, from less than 1% today. The UK government has also initiated a process to establish Highly Protected Marine Areas with the view to strengthen its MPA network, as such areas currently represent less than 0.01% of UK waters.<sup>83</sup> This opportunity to create strictly protected areas, inside existing MPAs or in new sites, is critical to strengthen the effectiveness of MPA networks. No-take zones and integral reserves are the most effective type of MPAs to protect and restore biodiversity,<sup>84</sup> and they must be well distributed across sub-regions and within MPA networks.

We call on each government to adopt a national target of **at least 10% strictly protected MPAs that prohibit all extractive and industrial activities**, with ambitious roadmaps to create them by 2025, so that they deliver on their full potential by 2030.

- The European Commission should **improve the standardised reporting of management measures** by EU Member States. The official data available are patchy and do not allow for rigorous assessments of management effectiveness across sites.<sup>23</sup> Better and more comparable data about the actual measures of protection in place within MPAs would allow for identifying successful approaches, as well as specific MPAs or features for which new or stronger measures are needed to ensure that sites achieve their conservation aims.
- On the basis of improved availability of spatial data showing human activities and pressures on EU seas, the European Commission should **carry out a comprehensive review of threats occurring in the marine Natura 2000 network**, and develop appropriate sectoral guidance documents to better implement EU legislation underpinning Natura 2000 in relation to specific economic activities. For example, our analysis identified maritime traffic as a broad-scale threat found across the MPA network, making it an activity that requires EU guidance on how to make it compatible with nature conservation obligations.





# Annexes

## Annex A. Overview of Natura 2000 MPAs

Table A.

Number and area of MPAs in the Natura 2000 marine network, by type and country, as of the end of 2018. Sites of Community Importance (SCIs) and Special Areas of Conservation (SACs) are designated under the Habitats Directive for the protection of certain listed habitats and (non-bird) species, while Special Protection Areas (SPAs) are designated under the Birds Directive, to protect the habitats of threatened and migratory bird species.

Country	All Natura 2000 MPAs			SCIs/SACs		SPAs	
	Number of MPAs	Total area (km <sup>2</sup> )	Median size (km <sup>2</sup> )	Number of MPAs	Total area (km <sup>2</sup> )	Number of MPAs	Total area (km <sup>2</sup> )
Belgium	10	1263	11.9	4	1120	6	317
Bulgaria	31	2832	14.7	18	2486	16	555
Croatia	300	4985	0.8	289	4665	11	1096
Cyprus	10	132	6.3	8	125	5	111
Denmark	195	19 141	17.3	134	16 578	68	12 224
Estonia	56	6753	16.4	49	3880	26	6482
Finland	205	8131	1.1	179	7665	93	7395
France	290	127 309	30.3	193	104 121	97	114 870
Germany	104	25 551	27.5	78	20 864	31	19 731
Greece	231	22 823	17.7	149	17 535	96	8515
Ireland	246	10 259	4.3	149	9788	97	1591
Italy	430	6920	1.3	375	5840	108	4066
Latvia	18	4384	0.3	17	2662	13	4277
Lithuania	16	1540	95.9	8	935	8	1054
Malta	30	4142	20.3	22	2282	13	3219
Netherlands	24	14 889	24.7	16	11 970	13	8429
Poland	30	7239	5.9	19	4341	12	7227
Portugal	59	38 400	16.5	40	31 260	19	8743
Romania	13	6359	135.7	11	6185	2	1627
Slovenia	12	10	0.2	9	4	3	10
Spain	308	84 399	9.8	231	54 889	138	51 949
Sweden	551	20 072	0.7	513	20 002	143	14 318
United Kingdom	280	117 857	24.6	160	107 524	121	23 007
<b>Total</b>	<b>3449</b>	<b>551 296</b>	<b>3.8</b>	<b>2671</b>	<b>436 722</b>	<b>1139</b>	<b>300 812</b>

# Annex B.

## Data and methodology for mapping threats

The details of each of the 13 threats included in the broad assessment are provided in Table B1, including the types and sources of data for each threat. All of the threat data corresponded to the year 2018.

Table B1.

Threats included in the assessment, with details of the data used to map them.

Threat	Description of threat	Data type	Data Source
Anchorage areas	Areas that are designated for vessels to drop anchor.	Polygons and points	85
Aquaculture farms	Areas used for aquaculture.	Polygons	85
Dredge dumping	Locations where dredged materials are dumped into the sea.	Polygons and points	85
Dredging	Locations where materials are removed from the seabed.	Polygons and points	85,86
Dredge dumping	Locations where dredged materials are dumped into the sea.	Polygons and points	85
Fishing	Locations of apparent fishing activity, based on Automatic Identification System (AIS) data from vessels.	Points	87,88
Oil and gas boreholes	Locations of boreholes related to hydrocarbon exploitation.	Points	86
Oil and gas installations	Locations of installations (e.g., platforms) related to hydrocarbon exploitation.	Points	85,86
Maritime traffic	Density of maritime traffic, based on AIS data from vessels (e.g., cargo, fishing, passenger, law enforcement, tanker).	Raster	86
Other platforms	Locations of offshore platforms not related to hydrocarbon exploitation.	Points	85,86
Ports	Locations of ports, based on traffic of goods, passengers, and vessels.	Points	86
Submarine cables	Locations of submarine cables (e.g., telecommunications, electricity).	Lines	85
Submarine pipelines	Locations of submarine pipelines (e.g., gas, oil).	Lines	85
Wind farms	Areas designated as wind farms.	Polygons	85,86

For some threats, data were available as polygons that demarcated specific areas where those threats occurred, while for others, locations were only indicated as points. For several of the threats for which only point locations were available, we added buffer areas around the points, based on published estimates of the spatial extent of impacts. Specifically, we created buffers with a radius of: 1 km around oil and gas platforms and boreholes;<sup>89,90,91</sup> 1 km around points marking the locations of dredging sites;<sup>92,93</sup> and 2 km around points indicating sites where dredge dumping occurred.<sup>94</sup>

In the case of fishing activities, an additional level of processing was necessary. We used data from Global Fishing Watch (GFW), a free online tool that uses public broadcast data from an automatic identification system (AIS), collected by satellite and terrestrial receivers, to show the movement of fishing vessels over time. AIS was initially designed as a safety mechanism for vessels to avoid collisions at sea. To this end, a vessel equipped with an AIS transponder autonomously broadcasts a signal as frequently as every few seconds with vessel identity and location information, including vessel name, position, speed, and direction. GFW applies a fishing detection algorithm (specifically, a convolutional neural network) to this global feed of AIS data to differentiate apparent fishing activity<sup>95</sup> from non-fishing (i.e., transiting) activity, based on vessel parameters such as speed, direction, and rate of turn.<sup>96</sup>

Oceana used GFW data describing fishing activities between January and December 2019 in EU waters (which then included the UK). In total, these data comprised 67 981 179 points corresponding to the locations of vessels during apparent fishing activities. We calculated fishing effort by aggregating apparent fishing hours, defined as the time each vessel apparently spent fishing. We confirmed active vessels from the EU by matching International Radio Call Signs (IRCS) and Community Fishing Fleet Register (CFR) numbers to the EU Fleet Register (EFR).<sup>88</sup> We then cross-checked data from GFW with information on fishing gear from the EFR, classifying vessels according to the primary gear types associated with them.

A potential limitation of this analysis relates to weaknesses in the regulations and requirements for vessels to be equipped with AIS transponders. The EU mandates that AIS transponders must be installed and used in all vessels over 15 m length.<sup>97</sup> However, even those vessels can cheat the system by falsifying their locations or by turning off their AIS transponders at will. It is also reasonable to assume that some vessels engaged in illegal fishing will intentionally not broadcast their AIS to avoid being caught. Oceana was unable to document the fishing effort of vessels not transmitting an AIS signal, including EU vessels below 15 m length, which can represent a large proportion of the fleet in certain regions (such as in the Mediterranean and Black Seas, where the artisanal fleet represents 84% of the fleet). The results of this analysis are therefore based on a conservative estimate of fishing effort, as they only included those vessels that transmitted AIS signals.

For the assessment of threats within Natura 2000 MPAs that have been designated (solely or partially) for the protection of seabed habitats, we focused on those threats that most directly affect the seabed. In the case of fishing activities, this required us to identify and select those fishing activities that posed a high risk to seabed habitats. To do so, we applied an approach that was developed by the N2K Group European Economic Interest Group (EEIG) in 2014.<sup>60</sup> This study, which was endorsed by the European Commission, aimed to identify fishing activities that could have significant negative impacts on features for which Natura 2000 sites have been designated. It was meant to complement the 2007 European Commission Guidelines to Member States for the establishment of the Natura 2000 network in the marine environment.<sup>98</sup>

One of the outputs of the N2K Group EEIG study was a matrix of potential vulnerability of Natura 2000 habitats to different fishing methods, which was developed based on published studies of commercial fisheries impacts on marine habitats in European waters.

We applied this matrix to the GFW data on apparent fishing activity, to identify interactions between designated habitat types in Natura 2000 MPAs and fishing activities using gears to which those habitats are highly vulnerable. In cases where the exact gear type (from the EFR) did not appear in the N2K Group EEIG matrix, we applied the same vulnerability level to interactions with each habitat type as for interactions associated with the most similar type of fishing gear. We adapted the matrix vulnerability scores in two cases, in order to reflect potential impacts of similar gear types more consistently. Specifically, we classified sandbanks as having 'probable vulnerability' to impacts from all types of bottom trawls.<sup>99</sup> The final matrix used is presented in Table B2, which shows the potential vulnerability of the Natura 2000 marine habitats to the different types of fishing methods, according to the EFR.

Using the matrix, we selected only those fishing activities that corresponded to 'probable vulnerability' interactions inside Natura 2000 MPAs. This selection took into account the habitat types that were designated features

within each MPA, and the fishing activities inside each MPA that were associated with 'probable vulnerability' (i.e., high risk) to the designated habitats. As above, it should be noted that the classification was based on only the primary gear type listed for each vessel.

**Table B2.** Matrix showing the potential vulnerability of Natura 2000 marine habitats to different fishing gear types used in European waters. The matrix is adapted from N2K Group EEIG,<sup>60</sup> to reflect potential vulnerabilities associated with apparent fishing activity inside Natura 2000 MPAs, for fishing gear types as recorded in the EU Fleet Register.<sup>88</sup> Interactions in red denote 'probable vulnerability', in which the habitat is known to be vulnerable to the fishing method in most instances; those in purple indicate 'possible vulnerability', in which the habitat may be vulnerable to the fishing method in certain cases or locations. For the threat assessment, high-risk fishing was considered to be those habitat-gear interactions labelled as 'probable vulnerability'.



Table B2.

Gear Group	Gear type	Sandbanks	Posidonia beds	Estuaries	Mudflats and sand-flats	Coastal lagoons	Large shallow inlets/bays	Reefs	Submarine structures made by leaking gases	Boreal/Baltic Narrow Inlets	Submerged or partly submerged sea caves
Dredges	Boat dredges	Probable									Unlikely
Dredges	Mechanised dredges including suction dredges	Possible						Unlikely	Unlikely		Unlikely
Dredges	Hand dredges operating from a boat	Possible									Unlikely
Bottom Trawls	Bottom otter trawls	Probable			Unlikely	Possible					Unlikely
Bottom Trawls	Bottom pair trawls	Probable			Unlikely	Possible					Unlikely
Bottom Trawls	Beam trawls	Probable			Unlikely	Possible					Unlikely
Bottom Trawls	Bottom trawls ( <i>Nephrops</i> )	Probable			Unlikely	Possible					Unlikely
Bottom Trawls	Otter twin trawls	Probable			Unlikely	Possible					Unlikely
Bottom Trawls	Twin-rig prawn trawls	Probable			Unlikely	Possible					Unlikely
Bottom Trawls	Bottom trawls (shrimp)	Probable			Unlikely	Possible					Unlikely
Pelagic Trawls	Mid-water otter trawls	Unlikely	Unlikely		Unlikely						Unlikely
Pelagic Trawls	Mid-water pair trawls	Unlikely	Unlikely		Unlikely						Unlikely
Rods and Lines	Handlines and pole-lines (mechanised)	Possible						Probable			
Rods and Lines	Handlines and pole-lines (hand operated)	Possible						Probable			
Rods and Lines	Trolling lines										
Longlines	Drifting longlines	Unlikely						Possible			Unlikely
Longlines	Set longlines	Possible						Probable			
Longlines	Long line	Possible						Probable			Unlikely
Longlines	Hook and lines	Possible						Probable			Unlikely
Traps	Pots and Traps	Possible	Possible	Possible	Possible	Possible	Possible	Probable		Possible	
Nets	Trammel nets	Possible		Possible		Possible	Possible	Probable		Possible	
Nets	Set gillnets (anchored)	Possible		Possible		Possible	Possible	Probable		Possible	
Nets	Drift nets			Possible		Possible	Possible	Probable		Possible	
Nets	Gillnets (not specified)	Possible		Possible		Possible	Possible	Probable		Possible	
Nets	Combined gillnets-trammel nets	Possible		Possible		Possible	Possible	Probable		Possible	
Nets	Encircling gillnets			Possible		Possible	Possible	Probable		Possible	
Nets	Boat-operated lift nets										
Surrounding nets	Purse seines	Possible									
Surrounding nets	Lampara nets										
Seines	Pair seines	Probable		Possible		Possible	Possible	Probable		Possible	Unlikely
Seines	Beach seines	Probable		Possible	Possible	Possible	Possible	Probable		Possible	Unlikely
Seines	Boat seines	Probable		Possible		Possible	Possible	Probable		Possible	Unlikely
Seines	Scottish seines	Probable		Possible		Possible	Possible	Probable		Possible	Unlikely
Seines	Danish seines	Probable		Possible		Possible	Possible	Probable		Possible	Unlikely
No gear	No gear										
Unknown gear	Unknown gear										

Probable vulnerability
  Possible vulnerability
  Unlikely vulnerability
  Limited information

# Annex C.

## List of sites selected for management assessment

**Table C.** MPAs included in the assessment of management plans and measures, by type (Special Area of Conservation: SAC; Special Protection Area: SPA). The MPAs selected were the largest designated SACs and SPAs for each country in the Natura 2000 marine network, as of the end of 2018.

Country	Type	Site Code	Site Name
Belgium	SAC	BEMNZ0001	Vlaamse Banken
Belgium	SPA	BEMNZ0003	SBZ 2 / ZPS 2
Bulgaria	SAC	BG0000573	Kompleks Kaliakra
Bulgaria	SPA	BG0002077	Bakarlaka
Croatia	SPA	HR1000035	NP Kornati i PP Telašćica
Cyprus	SAC	CY5000005	Akrotirio Aspro - Petra Romiou
Cyprus	SPA	CY5000005	Akrotirio Aspro - Petra Romiou
Denmark	SAC	DK00FX112	Skagens Gren og Skagerak
Denmark	SPA	DK00VA347	Sydlige Nordsø
Estonia	SPA	EE0040001	Väinamere
Estonia	SAC	EE0040002	Väinamere
Finland	SAC	FI0200090	Saaristomeri
Finland	SPA	FI0200164	Saaristomeri
France	SPA	FR5212016	Mers Celtiques - Talus du golfe de Gascogne
France	SAC	FR5400469	Pertuis Charentais
Germany	SAC	DE0916391	NTP S-H Wattenmeer und angrenzende Küstengebiete
Germany	SPA	DE0916491	Ramsar-Gebiet S-H Wattenmeer und angrenzende Küstengebiete
Greece	SAC	GR1430004	Ethniko Thalassio Parko Alonnisou - Voreion Sporadon, Anatoliki Skopelos
Greece	SPA	GR4220021	Mikres Kyklades, Voreioanatoliki Amorgos, Anatolikes Aktes Donousas, Gyro Nisides Kai Thalassia Periochi
Ireland	SAC	IE0003002	South East Rockall Bank
Ireland	SPA	IE0004077	River Shannon and River Fergus Estuaries
Italy	SAC	IT5160006	Isola di Capraia - area terrestre e marina
Italy	SPA	ITA010027	Arcipelago delle Egadi - area marina e terrestre
Latvia	SPA	LV0900300	Irbes saurums
Latvia	SAC	LV0900400	Rigas lica rietumu piekraste
Lithuania	SPA	LTKLAB001	Kuršių nerijos nacionalinis parkas
Malta	SAC	MT0000016	Filfla u l-Gżejjer ta' Madwarha
Malta	SPA	MT0000110	Żona fil-Baħar fin-Nofsinhar
Netherlands	SAC	NL2008001	Doggersbank
Netherlands	SPA	NL2016166	Friese Front
Poland	SPA	PLB990003	Zatoka Pomorska
Poland	SAC	PLH990002	Ostoja na Zatoce Pomorskiej
Portugal	SAC	PTDES0001	Ilhas Desertas

Portugal	SPA	PTZPE0060	Aveiro/ Nazaré
Romania	SPA	ROSPA0076	Marea Neagră
Slovenia	SAC	SI3000240	Sečoveljske soline in estuarij Dragonje
Slovenia	SPA	SI5000018	Sečoveljske soline
Spain	SPA	ES0000512	Espacio marino del Delta de l'Ebre-Illes Columbretes
Spain	SAC	ES90ATL01	El Cachucho
Sweden	SPA	SE0330308	Hoburgs bank och Midsjöbankarna
Sweden	SAC	SE0340097	Gotska Sandön-Salvorev
United Kingdom	SAC	UK0030352	Dogger Bank
United Kingdom	SPA	UK9020309	Outer Thames Estuary

It should be noted that in one specific case (*Filfla u l-Gzejjer ta' Madwarha* SAC in Malta), the MPA protects a broad marine habitat class, but does not directly protect any designated marine features. However, the area includes an extensive, 1 nautical mile buffer zone established through a Conservation Order to support the protection of the site.



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