Habitat protection under the Mediterranean Sea Regulation: A missed opportunity?

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Credits

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1. Executive Summary

The unrelenting overfishing and degradation of Mediterranean marine ecosystems over the last 15 years offer grounds for questioning the implementation of European Union (EU) policy responses. Not only it is the most overfished sea in the world, with 80% of its fish stocks overexploited, but the region's unique marine biodiversity faces increasing threats, including from climate change and invasive species, up to a point where the International Union for the Conservation of Nature (IUCN) estimates that 20% of all Mediterranean habitats and species are threatened with extinction. This report explores to what extent the EU Mediterranean Sea Regulation 1967/2006[1] has delivered, or not, on the protection of sensitive marine habitats and nursery areas as well as on the regulation of destructive fishing gear in Mediterranean fisheries.

In the first part of the report, we analyse information detailing habitat protection efforts (or a lack thereof) by EU Member States since 2007. All countries have generally adopted rules restricting bottom fishing in coastal waters in their national management plans, however this is undermined by too many derogations. As a result, we found that the most coastal of marine habitats, *Posidonia* beds, were generally better protected than coralligenous and maërl beds, which have been insufficiently mapped and protected in most Member States. Most countries have failed to designate specific Fisheries Protected Areas (FPA) to conserve fish stocks and sensitive habitats and instead reported areas that lacked scientific justification and were irrelevant to the objectives of the Mediterranean Regulation. In fact, most areas pre-dated this law or were already established for other purposes. Spain and Malta stand out due to exemplary efforts and approaches to protecting sensitive habitats.

In the second part of the report, we examine data showing recent bottom trawling activity over protected habitats and inside FPAs. A total of 7639 hours of bottom fishing occurred in 2019 over the three habitat types covered by the Mediterranean Regulation combined, with the highest bottom fishing intensity found over coralligenous beds, with almost 3,700 hours of fishing, nearly exclusively in Italy. For maërl beds, we found 2280 hours of fishing, mainly by Malta (1496 hours) and Italy (774 hours). Finally, a total of 1568 fishing hours occurred over seagrass beds, mostly located in Italy (1294 hours), Spain (157 hours), Greece (58 hours), and France (46 hours). The findings highlight clear gaps in implementation and enforcement of bottom fishing restrictions over protected habitats, particularly in Italy, where it occurred both over known sensitive habitats within and outside of coastal waters, as well as inside FPAs. Other EU countries did not have such high intensities of bottom fishing over protected habitats, but we detected some trawling in coastal waters, indicating weaknesses in enforcement. Spanish FPAs targeting maërl and coralligenous beds were the only well-enforced and effective examples of spatial protection in place.

We conclude with recommendations for EU Member States to improve implementation, and for the European Commission to inform future policies in the Mediterranean. Our analysis points to lax enforcement by the European Commission, likely giving Member States too much discretion concerning their national management plans and often disregarding scientific advice about possible weaknesses and poor scientific justification presented by national administrations. Finally, Oceana offers perspectives on how future Mediterranean fisheries management could strengthen the protection of sensitive habitats in a holistic way, through broad-scale fishing gear restrictions. Such measures would deliver ecosystem and climate benefits and also support artisanal fisheries in coastal areas.

2. Introduction

The Mediterranean Sea makes up less than one percent of the world's ocean, yet between four and 18 percent of the world's marine biodiversity can be found there.[2] Yet the "Great Sea", cradle of human civilization and global biodiversity hotspot, is slowly dying.

Mediterranean marine ecosystems have been described as being 'under siege' because of the intense pressure they face from a variety of human activities, including overfishing, habitat degradation, pollution, the introduction of non-indigenous species, and the impacts of climate-driven changes. A growing body of knowledge has shown a general depletion of commercial fish stocks over the last 50 years, along with a rapid decline of large predators and high levels of bycatch of sensitive species (e.g., sharks, seabirds, sea turtles, and marine mammals).[3,4] The fish stocks of the Mediterranean Sea are the most overexploited in the world,[5] and parts of its seabed are the most bottom trawled on the planet.[6]

The European waters of the Mediterranean Sea are not immune to these threats, particularly due to the impacts of Mediterranean fisheries, which are far from meeting the objectives of the Common Fisheries Policy (CFP).

Recent assessments[7] indicate that about 90 percent of assessed fish stocks caught by EU vessels are overexploited (41 stocks out of 47). On average, fishing mortality caused by EU fleets on Mediterranean stocks is 2.4 times greater than those associated with maximum sustainable yield (MSY). Meanwhile, EU Member States continue to permit fishing practices that are fundamentally incompatible with the objectives of EU environmental legislation, notably in relation to marine habitat protection and seabed integrity.

Given the poor health of Mediterranean marine ecosystems, it is important to consider the effectiveness of the main policy tools that are currently in place for their protection. One of these is Regulation EC/1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea (from now on, the 'Mediterranean Regulation'). In this report, we assess progress related to the protection of marine habitats against damages from bottom fishing activities, both from data reported by national administrations and from spatial analysis of fishing activities, and we provide recommendations for future policy developments.

3. Habitat protection and the **EU Mediterranean Regulation**

The Mediterranean Regulation applies to the conservation, management and exploitation of living aquatic resources in the Mediterranean Sea. It predates the 2013 reformed CFP but it was not repealed during the reform process, consequently creating a distinctive legal framework for EU Mediterranean fisheries. In 2019, some of the technical elements from the Mediterranean Regulation were incorporated into the EU Technical Measures Regulation (EU 2019/1241) which created a framework of common rules across EU sea basins, as well as specific regional measures. This development did not fundamentally change the Mediterranean Regulation measures related to habitat protection, which remain applicable.

The Mediterranean Regulation established a management framework for Mediterranean fisheries with shared responsibilities between the EU and the Member States with the development of national management plans. It also established technical rules and standards applicable across EU Mediterranean waters on protected species and habitats, fishing gear selectivity, minimum conservation reference sizes, recreational fishing, and fisheries control.

Some of these were innovative and forward-thinking at the time of adoption, particularly on the protection of marine ecosystems, nursery areas and spawning grounds, as well as sensitive marine ecosystems. In this sense, **two central measures are the prohibition of bottom-contacting fishing gear over certain coastal habitats (i.e., coralligenous habitat, maërl beds, and seagrass beds) and the establishment of Fishing Protected Areas (FPAs)**, both within territorial waters and beyond (National and Community FPAs respectively), to protect nurseries, spawning grounds, and the marine ecosystem.

The focus on coastal waters is relevant as these are the most impacted by human activities, as they concentrate usage and pressure both at sea and from land-based activities. At the same time, coastal waters are the most biologically productive part of our seas[8] offering shelter to fishes, crustaceans and other species, notably as important habitats are found, such as seagrass beds (*Posidonia oceanica* or *Cymodocea nodosa)*, coralligenous habitats, and maërl beds. These habitats are ecologically key (see Box 1) and are known to be essential fish habitats (EFH) and/or sensitive habitats in the Mediterranean basin (see Box 2).[9]

Box 1:
The ecological value of Mediterranean coastal habitats

Healthy coastal habitats are critical to support thriving Mediterranean fisheries. Seagrass meadows, coralligenous habitats, and maërl beds create complex habitats and give shelter to various marine organisms, especially juveniles, enabling them to rest and grow safely. The ecological importance of these three habitats is widely recognised, and they have been officially protected under EU law, such as the Mediterranean Regulation.

Figure 1.
Posidonia oceanica meadow (Balearic Islands, Spain)
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Figure 2.
Red mullets (*Mullus surmuletus*) swimming among *Cymodocea nodosa* leaves (Almería, Spain) © OCEANA / Rafael Fernández

Seagrass meadows are complex ecosystems formed by plant species that colonised the sea. In the Mediterranean, *Posidonia oceanica* **(Figures 1 and 5)** *and Cymodocea nodosa* **(Figure 2)** are the two main seagrass species, forming extensive and dense meadows. They are broadly distributed, and found in both shallow and deep waters, with *Posidonia* able to live down to 45 m depth. Seagrass meadows are known as 'forests' and 'jungles' of the sea, as they are home to hundreds of species and act as important carbon sinks.[10] They also protect the coastline from waves and extreme weather conditions, thereby helping to prevent erosion, and enhance productivity.[11] Threatened and iconic animals, such as seahorses and noble pen shells, strongly depend on seagrass beds for their survival.

Coralligenous habitats are created by coralline red algae that attach to one another, forming complex three-dimensional structures and becoming reefs which can grow up to 3-4 m high.[12]

Sessile fauna and flora settle on the surfaces of this habitat type and mobile species find shelter in its holes and cavities. Various animal species, such as bryozoans, polychaetes, and sponges, also contribute to building the coralligenous structure, both while living and when dead.[12] These habitats form the basis of very rich ecosystems, which are home to vulnerable species such as gorgonians, corals, and many more **(Figures 3 and 4)**.

Maërl beds, also known as rhodolith beds, are formed by nodules of coralline red algae, which do not form reefs, but live unattached. Like rolling stones in a river, maërl can cover huge extents of seabed, and in the Mediterranean can be found at depths down to 150 m.[13] These beds are home to many species, including important commercial species, such as hake, lobster and anglerfish **(Figure 6)**.

Figure 3.
Coralligenous reef covered by red gorgonians (*Paramuricea clavata*) in *Fort d'en Moreu* (Balearic Islands, Spain).

Figure 5.
Rhodoliths and seagrasses (*Cymodocea nodosa* and *Posidonia oceanica*) (Almería, Spain) © OCEANA / Juan Cuetos

Figure 4.
Coralligenous bed with globular colonies of ascidians (*Diazona violacea*) and green algae (Aeolian Islands, Italy).

Figure 6.
Juvenile anglerfish (*Lophius piscatorius*) on maërl bed on top of Ausiàs March seamount (Balearic Islands, Spain).

Strengthening the Habitats Directive provisions in the Mediterranean Sea

Seagrass meadows, coralligenous habitats, and maërl beds have uneven protection status under EU nature conservation laws. The EU Habitats Directive lists

Posidonia meadows in its Annex I of habitats of community interest, where it is considered as a priority habitat. But the Habitats Directive offers much less protection for coralligenous and maërl beds.

Although coralligenous habitats fall under Annex I, as a sub-type of *Reef*, specific protection of sub-types is not an obligation. With regards to maërl beds, two maërl-forming species are listed only in Annex V on management measures. This listing allows for regulating commercial exploitation, a provision that is irrelevant to Mediterranean maërl, as it is not commercially exploited. By granting a strict protection status to the three habitats in EU waters of the Mediterranean Sea, the Mediterranean Regulation strengthens the conservation provisions of the Habitats Directive for these specific habitats.

Box 2:
What are Essential Fish Habitats and Sensitive Habitats?

According to the Scientific, Technical and Economic Committee for Fisheries (STECF):[9]

- **Essential fish habitat (EFH)** is a habitat identified as essential to the ecological and biological requirements for critical life history stages of exploited fish species, and which may require special protection to improve stock status and long-term sustainability.
- **Sensitive habitats (SH)** are fragile habitats that are recognised internationally as ecologically important and which support important assemblages of commercial and non-commercial fish species and which may require special protection (e.g., *Posidonia* beds).

4. Previous assessments of **habitat protection under the Mediterranean Regulation**

Only a few evaluations have been carried out to date on the implementation of the Mediterranean Regulation. The first two of these assessments were done by WWF Mediterranean (in 2010)[14] and by the European Parliament (in 2013).[15] **Table 1** summarises the findings of those assessments with respect to habitat protection, which all point to poor implementation overall by EU Member States.

Table 1.
Summary of 2010 and 2013 evaluations of the Mediterranean Regulation in relation to habitat protection

	WWF Mediterranean (2010) *(Three years after the entry into force of the* **Mediterranean Regulation***)*	**European Parliament PECH (2013)** *(Seven years after the entry into force of the* **Mediterranean Regulation***)*
Article 4 on Protected Habitats	• Very weak implementation of protection of habitats listed in the Mediterranean Regulation • Fishing over protected habitats still occurring without derogations • Overall lack of knowledge of habitat distribution across Member States, despite some progress	• Mapping of habitat distribution was ongoing in all countries, with a primary focus on *Posidonia* beds (at various stages of progress according to Member States)
Articles 5, 6, and 7 on FPAs	• Deadlines to designate national FPAs had been disregarded • Doubts about whether some reported FPAs were really "new" • No Community FPAs had been designated (except a Fisheries Restricted Area (FRA) in the Gulf of Lyon under the General Fisheries Commission for the Mediterranean (GFCM)) and the Maltese Fisheries Zone	As of November 2013, there were: • 76 FPAs, of which 49 were inside previously existing marine protected areas (MPAs)
Article 9 on management plans	• Member States did not comply with the deadline to notify and adopt the first set of management plans • Derogations were being used as a 'back door', which undermined the rules • Management plans were widely viewed as the mechanism envisaged by the Regulation to escape the rules and grant permanent derogations to act below the standards	As of November 2013, there were: • 25 national plans adopted • 2 plans pending adoption • 11 plans submitted and under evaluation or revision


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In 2016, a more comprehensive evaluation was commissioned by the European Commission (EC) Directorate-General for Maritime Affairs (DG MARE).[16] According to it, 35 management plans had been adopted at the Member State level and six derogations had been approved in total. Many of these national plans included provisions on fishing gear restrictions to protect sensitive habitats and nursery areas, on mapping of sensitive habitats, but also introduced derogations for using towed gears over protected habitats under specific conditions. Since the entry into force of the Mediterranean Regulation and up until the 2016 evaluation, 76 FPAs had been listed pursuant to Article 5, 49 of which were located within previously existing marine protected areas (MPAs). Almost all FPAs considered, proposed or reported by Member States lacked solid scientific and technical justifications underpinning their establishment. None were formally submitted for evaluation by the STECF. Several potential FPA areas had no protection in place although they have been identified as possible future MPAs, for instance.

The European Commission evaluation pointed out that the majority of FPAs proposed or designated were located inside existing MPAs, thus considerably reducing the additional spatial protection offered by FPAs.

On top of this, a number of these MPAs did not have any management in place at that time, so the FPAs in effect only helped to implement fisheries restrictions inside MPAs where they would have been required anyway. Therefore, the FPAs only helped to enforce some unmanaged MPAs.

At the entry into force of the Mediterranean Regulation in 2006, most managing authorities stated that the Habitats or Birds Directives and not the Mediterranean Regulation were their motivation for declaring protected areas. They also considered that the contribution of the Mediterranean Regulation towards this specific objective was relatively low. Finally, the 2016 evaluation found that no Community FPAs (Article 6) or national FPAs (Article 7) had been designated. This evaluation also pointed to progress in terms of habitat mapping, applicable conservation measures especially with gear restrictions in shallow waters (Article 4), and increasing knowledge of the distribution of sensitive habitats, particularly *Posidonia* beds. However, it was unclear whether these positive developments were driven by the Mediterranean Regulation alone or by other legislation (e.g., the EU Habitats Directive).

5. Oceana's assessment of **Mediterranean Regulation habitat protection**

Building on previous evaluations, Oceana's analysis is twofold: the first part explores the details of information reported by EU Member States on habitats protection under the Mediterranean Regulation, whereas the second part investigates the actual fishing footprint over known protected habitats to assess the implementation and compliance against reported measures and to identify areas that may need further protection.

Scope of the assessment

This analysis focuses specifically on the main provisions of the Mediterranean Regulation related to the conservation of marine habitats, from Chapter II on "Protected Species and Habitats" and Chapter III on "Fishing Protected Areas", and notably the following:

- Article 4: **Prohibits fishing with certain gear-types above protected habitats** such as seagrass beds (in particular, *Posidonia oceanica*), coralligenous habitats, and maërl beds and requires Member States to identify and map the distribution of these habitats;

- Article 5: Required Member States to **provide information** to the EC on the establishment of FPAs and related possible management measures before 31 December 2007, where the protection of nursery areas, of spawning grounds or of the marine ecosystem requires special measures to address the harmful effects of fishing;

- Article 6: Requires the Council to designate **Community FPAs** beyond the territorial waters of Member States, based on submitted information in Article 5;

- Article 7: Required the designation of **national FPAs** in the territorial waters of the Member States, by 2008.

- Article 13: Protects the **coastal zones**, prohibiting the use of towed and surrounding nets within 3 nautical miles of the coast or within the 50 m isobath (with some derogations possible).

Under the Mediterranean Regulation, **national management plans** are the central instrument regulating specific fisheries in territorial waters (as provided by Article 19). Member States were required to adopt national management plans for certain fisheries before 31 December 2007 (e.g., trawl nets, boat seines, shore seines, surrounding nets, and dredges).

Our assessment consists of two parts. The first part (detailed in Section 5.1) is an analysis of documents describing the implementation of habitat protection measures by Member States under the Mediterranean Regulation. It looks at the general regime of strict protection applicable to the habitats, wherever they occur, as well as the role of FPAs which should offer a stricter protection regime. The analysis specifically draws on two main types of information:

- Publicly available information about management plans and habitat protection under the Mediterranean Regulation, particularly information submitted to the STECF for evaluation;
- Correspondence and information shared between the EC and EU Member States over the period 2007-2014 on the implementation of Articles 5, 6, and 7.

In fact, the information on FPAs is not public most of the time, whereas we feel it deserves scrutiny. The idea of accessing documentation was to find out the technical or scientific justifications provided to the EC on habitats protection measures and to check whether they were substantiated.

The second part of our assessment (detailed in Section 5.2) is a spatial analysis of the overlap between bottom fishing and habitats protected under the Mediterranean Regulation. This analysis combines two sources of information:

- Data on bottom fishing activities of the EU fishing fleet in 2019, from Global Fishing Watch (GFW);[17]
- Data on the distributions of coralligenous, maërl, and seagrass beds from the Mediterranean Sensitive Habitats (MediSeH) project.[18]

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6. Analysis of documentation **detailing Member State implementation of the MedReg**

We compiled all the available information describing habitat protection measures by Member States under the Mediterranean Regulation. One of the key sources used was public information on national management plans, as the most recent plans were scientifically evaluated by the STECF. Out of the 35 plans adopted, STECF evaluations are publicly available for 15 (the most recent ones), including those for Croatia, France, Greece, Italy, Slovenia and Spain.[19] We have analysed these evaluations, including those for Member States that have regularly revised their management plans over the years.

We also analysed information received through an access to documents request made to DG MARE in early 2020, pursuant to Regulation (EC) No 1049/2001.[20] Specifically, Oceana requested access to information within the EC services that was reported by national authorities on Articles 5, 6, and 7 of the Mediterranean Regulation. Oceana received a total of 37 documents, comprising official letters, reports and decrees/laws, from all Mediterranean EU Member States, except Croatia. This information related to follow-up efforts by the EC on the implementation of the Mediterranean Regulation, notably through the following:

- **June 2009:** Organisation of a technical compliance meeting, with letters and questionnaires sent to national administrations to gather data;
- **June 2010:** An EC press release to urge better implementation three years after the adoption of the Mediterranean Regulation. The EC identified serious violations and failures to fulfil obligations within agreed deadlines;[21]
- **December 2012:** Official letters sent to national administrations to gather updated data on compliance with Chapters II and III of the Mediterranean Regulation.

All the documents were analysed to identify data reported pursuant to habitats protection and FPAs. The information received was checked, for instance against official decrees and against supporting technical and scientific information. Information on habitats provisions was also extracted from management plans and related STECF evaluations to assess the ambition of measures.

Main findings

The main findings of our analysis of documentation confirm important weaknesses in the implementation of the Mediterranean Regulation provisions concerning the protection of sensitive habitats. Despite its relevance and coherence with EU and regional environmental legislation such as the UNEP/MAP Barcelona Convention, implementation of the Mediterranean Regulation has not delivered its intended objectives. National management plans have typically included effort management measures combined with specific technical rules, but not specific habitat protection measures. On the contrary, we found several derogations to allow the use of towed gear over Mediterranean Regulation protected habitats (Article 13) for instance for “traditional fisheries”.

The 2016 EC evaluation listed 6 derogations approved in total , and pointed to these derogations as being possibly ambiguous, as they may on one hand support a specific objective whilst undermining another, as for example in the case of a derogation for a potentially environmentally harmful gear on socio-economic grounds. We also found that some derogations were not scientifically sound as the STECF could not evaluate their compatibilities with sustainable exploitation of commercial stocks nor if there were no significant impact on the marine environment.

This was often due to the absence of supporting data by Member States, which calls into question the science-based approval process of the management plans by the EC. Below are general findings, followed by a more detailed analysis for each Member State.

Overall, we found that all national management plans had integrated the basic **fishing restrictions for towed gear above protected habitats in coastal waters** (3 nm/50 m isobath limit) under Article 4, despite several derogations allowing trawling closer to shore and traditional fishing gears over protected habitats. Most countries have considered provisions to protect habitats to some extent. This is particularly true for inshore areas and *Posidonia* beds, for which a greater focus exists.

Extensive mapping and identification of the distribution of *Posidonia* meadows has been carried out in all EU waters[22] and is even reported as completed in some Member States (i.e., France, Italy, and Spain). This attention to *Posidonia*, however, has come at the expense of coralligenous habitats and maërl beds, which have been largely overlooked by Member States in their management plans and reporting. It is estimated that data on coralligenous habitat and maërl beds are available for approximately 30% of the Mediterranean coasts, while for the remaining 70% no information was found.[23] Fourteen years after the Mediterranean Regulation entered into force, the distribution of these two habitat types is only partially known, whereas several research efforts have helped gather enough sound information to improve mapping and protection.

Regarding **Fishery Protected Areas (FPAs)** to conserve fish stocks and/or sensitive habitats, the majority of areas that Member States reported as FPAs did not explicitly justify that designation under the meaning of Articles 5 or 7 of the Mediterranean Regulation. The information analysed by Oceana was very similar to the data from the European Commission evaluation in 2016, and it seems that no further reporting has been done since 2013 – nor any compliance follow-up by the EC. Besides, many areas reported either pre-dated the adoption of the Mediterranean Regulation, had already been established for other purposes (e.g., MPAs), or were simply insufficient, because they were too few, too small, or patchily distributed. A few notable exceptions exist, such as FPAs designated in Spain and Malta to protect coralligenous or maërl beds, even if these areas were not found to be formally reported as FPAs to the European Commission. Overall, the scientific and technical justifications underpinning the creation of FPAs was often poor or not provided at all in the reporting.

Finally, since 2016, **new Community management plans** (now called EU Multiannual Plans under the CFP framework) have been proposed in the Mediterranean Sea: one for demersal fisheries in the Western Mediterranean Sea (adopted as Regulation (EU) 2019/1022) and one for small pelagic fisheries in the Adriatic Sea (not yet adopted - COM(2017) 97). The former includes, in its Article 13, provisions to further extend the protection of coastal habitats, nursery, and spawning grounds.

The following section presents Oceana's country-level analysis of the national information reported to the EC under the Mediterranean Regulation's Articles 4, 5, 6 or 7. The quality and extent of information reported varied greatly among countries.

6.1. Country analysis findings

Croatia

The 2013 proposed Croatian Management Plan for bottom trawl fisheries contained a complex and restrictive system of spatial-temporal measures regulating trawling and permanently banning certain trawling activities (e.g., in numerous bays and channels), covering approximately 30% of the territorial sea of Croatia. This plan was submitted as a draft to the STECF in 2013; as the details of the final plan adopted are not known, we can only assess the proposed measures. These measures aim at reducing the impact of trawling on the marine environment, for instance through the establishment of additional FPAs, and comprise:

- Creating FPAs in the open sea in Jabuka pit, covering approximately 10 000 km^2, including no-take zones of approximately 2000-3000 km^2.
- Enforcing a trawling ban at depths greater than 500 m in the southern part of the fishing grounds.

The area around the Jabuka pit area already subject to temporal closures since the 1990s, then partly protected under both Italian and Croatian legislation, and was finally subject to a bilateral agreement in 2015.[24,25] In 2017, the area was designated as a Fisheries Restricted Area (FRA) under the General Fisheries Commission for the Mediterranean (GFCM).[26] Croatia also requested derogations concerning the minimum distance from the coast for bottom trawl nets, to account for the geomorphological configuration of the Adriatic Sea (and to allow trawling nearer to the coast in certain areas). The STECF evaluation was inconclusive, due to the lack of information provided. Similarly, Oceana did not receive any official correspondence between the Croatian authorities and the EC and could not assess which FPAs were officially reported.

Cyprus

At the end of 2007, no FPAs had been reported by Cyprus to the EC pursuant to Article 5 of the Mediterranean Regulation; the Cypriot authorities later designated one FPA in 2008.[27] This area, *Zygi*, covered 70 km^2 and was intended to mitigate overfishing, allow stocks to recover, and favour artisanal fishers. The authorities also reported work in progress to adopt fisheries management in two marine Natura 2000 sites, *Cavo Greco* (9 km^2) and *Moulia* (2 km^2).

The implementation of FPAs by Cyprus is clearly insufficient. This fact, along with the very small areas protected and patchy approach, leaves large parts of the Exclusive Economic Zone (EEZ) unprotected.

France

The French management plan[28] adopted in 2013 refers to general provisions to protect sensitive habitats (in line with Article 4 of the Mediterranean Regulation) and to the prohibition of trawling within 3 nm/50 m depth and over protected habitats like *Posidonia oceanica* beds, coralligenous habitat, and maërl beds. However, no specific or significant FPAs were designated for habitat or nursery protection. In their most recent reporting to the EC in 2013, the French authorities referred to several protected areas with some fisheries restrictions, including:

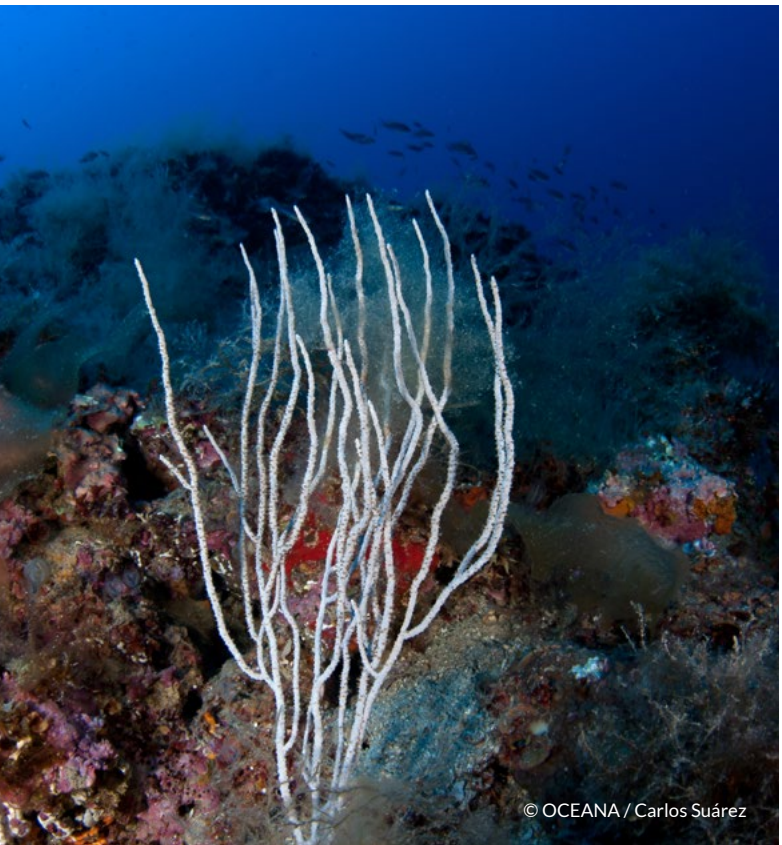
- MPAs: 37 marine Natura 2000 sites, 4 marine reserves and 2 National Parks;
- the Gulf of Lion Fishery Restricted Area adopted under GFCM in 2009;
- a 220 ha closure in Marseille Bay (2008) to protect the seabed and install artificial reefs;
- 10 fisheries closures (cantonnements) created between 1961 and 2008.

Unfortunately, the majority of these areas already existed before the Mediterranean Regulation entered into force – some of which had been in place for several decades, like the National Park of *Port Cros* and some *cantonnements*. As pointed out by the EC, some reported

areas were also not directly related to the objectives of the Mediterranean Regulation, such as many of the MPAs reported. Moreover, most of these reported MPAs, such as the Natura 2000 sites, did not yet have any fisheries management measures or restrictions in place (which remains the case for almost all MPAs at present). The marine reserves and National Parks (*Calanques* and *Port-Cros*) do have some fisheries management measures such as spatial restrictions and zoning. The only new area that brings additional value through the Mediterranean Regulation is the relatively small but innovative closure adopted in the Marseille Bay (Prado area) to install artificial reefs.

Finally, in 2018, the French authorities created four closures to bottom-contacting fishing gear in the Gulf of Lion. Three small areas are permanently closed to protect spawning hake and red mullet, while a temporal closure aims to protect juveniles of these species.[29] These areas have not been formally reported as FPAs under the Mediterranean Regulation.

The French plans also created a derogatory regime to allow for the continuation of guangi trawlers to operate over *Posidonia*, something which would have been otherwise prohibited under the Mediterranean Regulation due to their potentially destructive impacts.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Greece

The Greek management plan that implements the Mediterranean Regulation states that the total length of the coastline where the operation of towed gear must be prohibited is 2730 km (16.59% of the Greek coastline). This is primarily related to the prohibition on trawling in coastal areas (within 3 nm/50 m depth).

Greece also reported seven FPAs under Articles 5, 6, and 7 of the Mediterranean Regulation. Three small coastal areas with complete bans on fishing were permanently designated in 2007: *Kalymnos/Kos* (8.8 km^2), *Ierisos* (10.1 km^2) and *Preveza* (5.4 km^2). Another area (*Fanari/Rodopi* – 6 km^2) was closed from 2000 to 2004 for scientific monitoring purposes. Three other closures were designated in 2009: the *Gulf of Lakonia*, *Gulf of Thessaloniki*, and *Gulf of Thermaikos* (with artificial reefs placed in some of these areas). It is unclear whether these areas had all been established or were only in the process of being established at the time of reporting. In addition, the Greek authorities reported three National Marine Parks in relation to FPAs: *Alonissos/Sporades* (the largest in Europe, at 2100 km^2), *Zakynthos* (135 km^2) and *Messolonghi* (150 km^2).

The first set of FPAs protect coastal and nursery areas, but only encompass a combined area of about 30 km^2, which is largely insufficient compared to the area of Greek waters. All three National Parks reported by the Greek authorities existed prior to the Mediterranean Regulation, as did some of the fishing closures reported, such as in the *Gulf of Lakonia*, *Gulf of Thessaloniki* and *Gulf of Thermaikos*, which were implemented under older fishing regulations.

Finally, in the context of Article 4 on the mapping of habitats, the Greek authorities have long announced and initiated national mapping for *Posidonia* meadows (including under EU-funded projects). The EC, however, noted in 2012 that no progress on national identification and mapping of *Posidonia* meadows had been reported. Regrettably, nothing had been reported on the mapping of other protected habitats under the Mediterranean Regulation (maërl and coralligenous beds).

Italy

The analysis of information about Italian implementation of the Mediterranean Regulation provisions on FPAs indicates limited efforts to meet its obligations. In 2013, Italian authorities reported only four protected areas to the EC, namely two MPAs established in 2007 (*Bergeggi* and *Regno di Nettuno*) and two national parks with marine parts. Although the two MPAs do have zoning in place with some spatial fisheries restrictions, they cover only 112 km^2 and 9 km^2, respectively, and therefore cannot be considered sufficient. In addition, Italy reported 23 other MPAs, some of which had some zoning restrictions but were not reported comprehensively.

More interestingly for the implementation of the Mediterranean Regulation, Italy reported in 2009 that it had designated 12 permanent "Zone de di Tutela Biologica" (ZTB). The ZTB are fishery spatial-management tools specifically designed to conserve biological marine resources. Created in 1965, they had first been established on a temporary basis, between 1998 and 2004, to protect important nursery and spawning grounds and to reduce local fishing pressure. In 2009 the Italian authorities made the ZTB areas permanent. Eleven of the ZTB are of moderate size (15-250 km^2) and one is significantly larger (*Fossa di Pomo* – 2200 km^2).

Despite having been in place prior to the Mediterranean Regulation, the ZTB are a valuable type of FPAs in principle, designed to support fisheries management and with a potential to protect EFH. However, their number remains too small to adequately cover the protection of key habitats within the extensive Italian Exclusive Economic Zone (all ZTBs represent less than 0.17 % of the Italian EEZ). On top of this, a 2016 study indicated poor compliance of fishing vessels in the ZTB and concluded that almost all ZTB were illegally trawled.[30]

Malta

As a response to the questionnaire sent by the EC in 2012 on compliance with Chapters II and III of the Mediterranean Regulation, Malta reported 12 sites as FPAs, and proposed five new FPAs. Some of the reported FPAs were MPAs designated prior to the adoption of the Mediterranean Regulation, such as the temporary closures of specific nursery grounds in place since 1934, or the marine area between *Rdum Majjiesa* and *Ras Ir-Raheb* established in 2005. Another five were designated after the Mediterranean Regulation entered into force, such as a marine area on the edges of *Dwejra* (Gozo) in 2007, conservation areas around wrecks in 2008, or a marine area in the Northeast of Malta in 2010. For another four reported FPAs, the date of establishment was not provided. Among the areas reported, five of them were established to protect *Posidonia* beds, while the protection of maërl or coralligenous habitats was not reported. Three of the five areas proposed as future FPAs were focused on deeper areas, which are not relevant to the coastal habitats listed under Article 4 of the Mediterranean Regulation. Two of those areas were later protected as Natura 2000 sites, and one as a FRA under the GFCM in 2016 (*East of Malta Bank*). At least one of the two additional proposed areas did aim to protect maërl beds.

When it joined the EU in 2004, Malta negotiated the creation of a 25 nm Fisheries Management Zone around the Maltese Islands, reserved primarily for artisanal fisheries (vessels below 12 m) with some derogations. This management zone, recognised in Article 26 of the Mediterranean Regulation, created an exclusion zone for trawlers to promote the small-scale artisanal sector and limit fisheries impacts on the marine environment. In 2012, Malta further reduced the trawlable area, following new scientific data indicating the presence of maërl beds inside some of the authorised areas.[31] Recently, additional information has been made available on maërl distribution in Malta, collected under the EU-funded LIFE BaĦAR project,[32] but its analysis is currently ongoing.

Slovenia

Slovenia reported two existing FPAs, in *Portorož* and *Strunjan*, both designated in 2006 prior to the adoption of the Mediterranean Regulation and with the purpose of protecting fisheries resources. Commercial and recreational fishing is prohibited in those areas, with possible derogations using special permits (e.g., for fishing mullets in winter). The absence of new FPAs established under the Mediterranean Regulation is justified by the Slovenian authorities on the basis of the small area of its waters and the low relative volume of catches by Slovenia of shared North-Adriatic stocks. The authorities are rather supportive of cooperation for future international FPAs, such as Jabuka Pomo Pit. In addition, Slovenia reported having completed the mapping of its *Posidonia* beds in 2003, while detailed mapping of other habitats and Natura 2000 sites was ongoing. It is unclear whether any coralligenous and maërl beds have been identified in Slovenian waters.

Spain

In its response to the EC in 2013, Spain reported seven marine reserves of fishing interest (*Isla de Tabarca*, *Islas Columbretes*, *Cabo de Palos e Islas Hormigas*, *Cabo de Gata-Níjar*, *Isla de Alborán*, *Masía Blanca* and *Llevant de Mallorca-Cala Rajada*) and two areas where fisheries restrictions applied (the *Vol de Tossa* maritime zone and an anchovy nursery area in Catalonia). The Spanish authorities also presented possible areas for future FPAs, such as areas being surveyed at that time under the EU-funded LIFE+ INDEMARES project,[33] which were later protected as Natura 2000 MPAs, some of which on the basis of the presence of *Posidonia* meadows, coralligenous habitat, and maërl beds. Additionally, Spain presented two more areas for future designation as FPAs in the Balearic Islands (areas also proposed by Oceana): two seamounts in the Mallorca Channel (Emile Baudot and Ausiàs March), and the coralligenous reef *Fort d'en Moreu* to the East of Cabrera National Park **(Figure 7)**. These 2 areas were officially designated as FPAs to conserve coralligenous habitats and maërl beds in 2014,[34] and enlarged in 2016,[35] in light of new information on the distribution of protected habitats.

The second FPA was designated in 2016,[33] as a result of habitat mapping carried out under the INDEMARES project – which culminated in the designation of the Natura 2000 site "Canal de Menorca" in 2014. Thanks to new data acquired on the distribution of coralligenous habitats, a smaller area within the Natura 2000 site was designated as an FPA. While other Mediterranean areas with coralligenous habitat and maërl beds have been mapped and protected as Natura 2000 MPAs (e.g., *Chella Bank*, *Cap de Creus*, *Columbretes*, *Alboran Island*) no corresponding FPAs have been designated. In 2018, a trawling ban in shallow waters from 70 m depth inside the Alboran Island Marine Reserve – a protected area designated in 1998 for the protection of fish stocks – was extended to 100 m depth, thus increasing the protection of coralligenous and maërl beds present in the area. This decision has apparently not been reported to the EC as an FPA under the Mediterranean Regulation.

Figure 7.
Forest of red gorgonians (Paramuricea clavata) on coralligenous reef in Fort d'en Moreu (Balearic Islands, Spain).

7. Spatial analysis of **fishing activities over protected habitats**

The section below presents the spatial analysis of the main Mediterranean Regulation habitat protection measures in relation to bottom fishing activities, with the aim to check compliance with FPA areas reported and coastal protection, as well as identify areas with known protected habitats where bottom fishing activity took place. This will inform the general compliance and enforcement of Mediterranean Regulation habitats protection rules.

7.1. Methodology

To carry out this project, we used two main datasets, one from Global Fishing Watch (GFW)[17] and the other from the MediSeH project.[41] GFW is 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[36] from non-fishing (i.e., transiting) activity, based on vessel parameters such as speed, direction, and rate of turn.[37]

Oceana used GFW data describing fishing activities between January and December 2019. We calculated the fishing effort by aggregating apparent fishing hours, defined as the time each vessel apparently spent fishing. We confirmed active vessels from the European Union (EU) by matching International Radio Call Sign (IRCS), and Community Fishing Fleet Register (CFR) numbers to the EU Fleet Register (EFR).[38] We cross-checked data from GFW with information on fishing gear from the EFR. For this analysis, we only took into account bottom otter trawl (OTB) as the main fishing gear, as it can be accurately identified and represented 99% of the apparent fishing activity detected. We also detected significant fishing hours from a 'non-available' gear category, according to the European Fleet Register, for which towed gear may be misreported or mis-identified.

Consequently, we did not include this category in the analysis. Finally, for the analysis of fishing hours inside coastal waters, as defined in Article 13 of the Mediterranean Regulation, we calculated fishing over distributed Mediterranean Regulation habitats only, so the results underestimate the actual total bottom fishing in the 3 nm/50 m depth coastal area.

A potential limitation of this analysis relates to weaknesses in the regulations and requirements for vessels to be equipped with AIS transponders. The IMO requires all ships over 300 gross registered tons to be fitted with AIS transponders,[39] though fishing vessels are exempt unless AIS is required by the flag or coastal state. For example, the EU mandates that AIS transponders must be installed and used in all vessels over 15 m length.[40] Therefore, AIS data are biased in favour of larger vessels whose flag state requires them to use AIS transponders. 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 Mediterranean countries (where the artisanal fleet represents 80% of the fleet). The results of this analysis are therefore a conservative estimate of fishing effort in this region and only include those vessels that transmitted AIS signals.

The second dataset, from the MediSeH Project,[41] describes the known distributions along the Mediterranean coast of the three habitats protected under Article 4 of the Mediterranean Regulation. We incorporated this information into our analysis, omitting distribution points derived from predictive methods. We then assessed the overlap between the two data sources, using Esri ArcGIS Pro software to identify areas of bottom fishing activity over the protected habitats, and to map that activity.

Figure 8.
Fishing gear entangled on the coralligenous reef of Fort d'en Moreu (Balearic Islands, Spain).

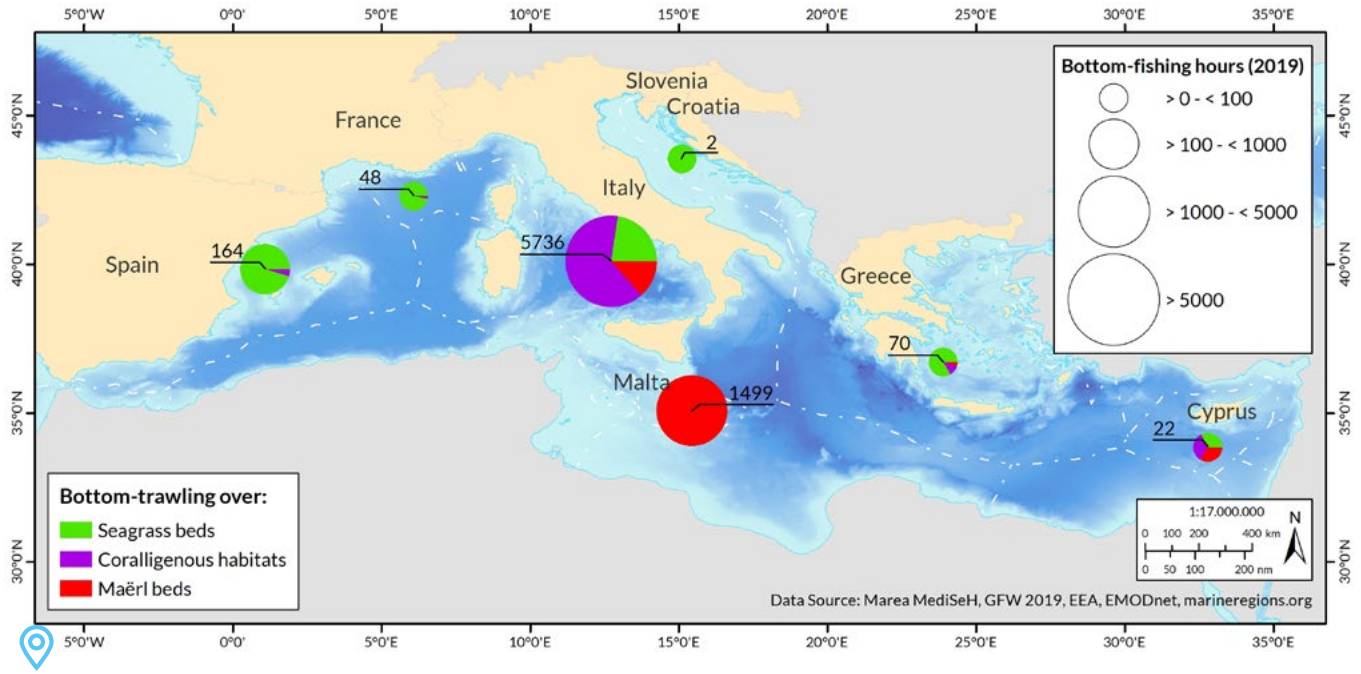

Figure 9.
Bottom fishing hours with OTB gear over protected habitats in 2019 in EU Mediterranean waters

7.2. Overall results of our analysis

Our analysis revealed a total of 7639 hours of fishing activity with towed gear in 2019 over the three habitat types that are theoretically protected under the Mediterranean Regulation. The highest levels of fishing activity were found over coralligenous beds, with almost 3,700 hours of fishing, carried out nearly exclusively in Italy (3667 hours). For maërl beds, we found 2280 hours of fishing, mainly by Malta (1496 hours) and Italy (774 hours). Finally, a total of 1568 fishing hours occurred over seagrass beds, mostly located in Italy (1294 hours), Spain (157 hours), Greece (58 hours), and France (46 hours) **(Figure 9)**.

In total, Italy was the EU Member State with the highest intensity of bottom fishing activity over protected habitats: more than 5500 hours, with a particularly heavy proportion on coralligenous habitat **(Table 2)**. Italy is one of the Member States with the most comprehensive mapping of protected habitats, thanks to important identification efforts that were deployed. It is worth taking into account the comparatively higher availability of data in Italian waters when considering the findings. The incomplete mapping efforts done by other EU countries likely result in lower fishing activity on protected habitats. If a more complete identification of habitats, especially maërl and coralligenous existed in these countries, it is probable that higher fishing intensities would be detected. In Maltese waters, despite the existence of specific trawling zones – a type of management unique in European waters – we detected a significant amount of bottom trawling (nearly 1500 hours) in areas harbouring maërl beds, both inside and outside these trawlable areas.

In comparison to the other two habitat types, we observed relatively less fishing over seagrass beds. The highest levels of fishing over *Posidonia* were observed in Italian waters, followed by Spain.

In general, levels of bottom-trawl fishing over all three protected habitats appeared to be low in Croatia, Cyprus, France and Greece **(Figure 9)**.

A specific look at bottom fishing over protected habitats inside the 3 nm/50m depth zone along the coast showed the greatest intensity of apparent fishing within the waters of Italy (more than 1342 hours) and Spain (155 hours) (see **Table 2**). Typically, this corresponds to trawling above *Posidonia* meadows and other seagrasses that are found in shallower waters.

Table 2.
Number of bottom fishing hours with OTB gear in 2019 over habitats protected under Article 4 of the Mediterranean Regulation, by EU Member State

EU Member States	Total bottom fishing hours over MedReg protected habitats	Bottom fishing hours over MedReg protected habitats inside 3 nm/50 m isobath
Croatia	3	3
Cyprus	22	0.4
France	48	28
Greece	70	57
Italy	5736	1342
Malta	1499	3
Spain	164	155
Slovenia	0	0
Total	**7541**	**1588**

It should be noted that some of this apparent fishing activity may have been authorised under derogations granted by Member States. Such derogations are permitted under Article 13 of the Mediterranean Regulation, thereby permitting fishing operations to occur closer to the shore (e.g., for *volantina* trawlers in Slovenia, or for *gangui* trawlers in France). However, the STECF has often been unable to evaluate these derogations, particularly with respect to their possible impacts on the marine environment, due to a lack of appropriate data and information.

Although Oceana appreciates the legality of derogations, we explained earlier how they were not always scientifically evaluated and likely too permissive, thus undermining the objectives of protecting coastal habitats. The impact of the passing of just one trawl over a protected habitat could in fact cause irreversible damage to these ecosystems, as has been witnessed with *Posidonia* beds **(Figure 10)** or with fishing gears entanglements on corraligenous beds **(Figure 8)**.[42]

Derogations also add further complexity in terms of management and may create loopholes if no proper evaluation is conducted to confirm their justification.

Based on the MediSeH data on habitat distributions, we estimated that only 77.6% of the known Mediterranean Regulation habitats distribution were found within the 3 nm/50 m isobath limit, as defined under Article 13. An important part of their distribution is indeed also found at greater depths and further away from the coast, especially for coralligenous and maërl habitats.

Extending the prohibition of towed gears further and deeper would improve the effectiveness of the protection of these sensitive habitats. For instance, extending the prohibition within 10 nm / 150 m isobath limit, would substantially increase the protection coverage to almost the entirety of known distribution in EU waters **(Table 3)**. This would also better reflect the extraordinary knowledge increase on habitats distribution and mapping from the past 10 years.

Table 3.

Estimated total and percent coverage of combined habitats protected under Article 4 of the Mediterranean Regulation, within combinations of ratio "distance from shore / depth, where that depth is reached at a shorter distance from the shore"

Distance (nm) or depth (m) when reached before	Area (km²) of mapped MedReg habitats in EU Mediterranean waters	% of known EU distribution of MedReg habitats
3 nm or 50 m	6457.0	77.6
3 nm or 100 m	6800.3	81.7
3 nm or 150 m	6835.2	82.1
6 nm or 50 m	6919.3	83.1
6 nm or 100 m	7539.7	90.6
6 nm or 150 m	7593.0	91.2
8 nm or 50 m	7022.2	84.4
8 nm or 100 m	7757.7	93.2
8 nm or 150 m	7824.1	94.0
10 nm or 50 m	7076.0	85.0
10 nm or 100 m	7919.0	95.1
10 nm or 150 m	7995.0	96.0

Figure 10.
Trawling impacts on seagrass bed. Roquetas de Mar, Almería, Spain. © OCEANA/ Juan Cuetos

7.3. Case studies

Based on the results of our analyses, we selected a set of six case studies that highlight specific aspects of habitat protection – or a lack of protection – under the Mediterranean Regulation. Such aspects include the application of unique management measures (Malta and Spain), and significant patterns of fishing activity over protected habitats, both inside and outside of protected zones (Spain and Italy). On top of these selected cases presented below, four other areas were analysed and did not show any bottom fishing – three Greek FPAs (*Kalymnos/Kos*, *Ierisos* and *Preveza*) and one FPA in Cyprus (*Zygi*).

The Maltese Fisheries Management Zone

The Maltese Fisheries Management Zone (FMZ) excludes trawling in all Maltese waters up to 25 nautical miles from the coast, except inside a set of areas in which this activity is permitted, as established under Article 26 of the Mediterranean Regulation. This approach to trawling management is unique in EU waters and to the entire Mediterranean, where boundaries are typically established to define areas where restrictions are applied to protect specific features or to regulate MPAs or navigation channels.

Our analysis of bottom-trawl fishing activity in 2019 makes it apparent that such activity in Maltese waters occurred mainly inside the authorised trawling zones, reflecting overall good compliance **(Figure 11)**. However, we also detected some fishing activity inside the FMZ waters, as well as inside the 3 nm/50 m zone, over mapped *Posidonia* meadows off *Mellieha Bay*.

Also problematic is the fact that maërl beds documented to the east of Malta island[32,41] overlap with an authorised trawlable zone. As explained above (see *Country analysis: Malta*), Malta has already adjusted some of these authorised zones to avoid fishing impacts on habitats, and this trawlable area where maërl beds have been documented should be similarly adjusted.

In general, the Maltese approach to fishing management seems to be effective in protecting sensitive Mediterranean habitats from the impacts of bottom trawling, but it consequently concentrates this activity inside specific areas, which may have significant impacts on the seabed and associated ecosystems within those zones. This is an example that could be replicated in other countries, following scientific information on habitat distributions.

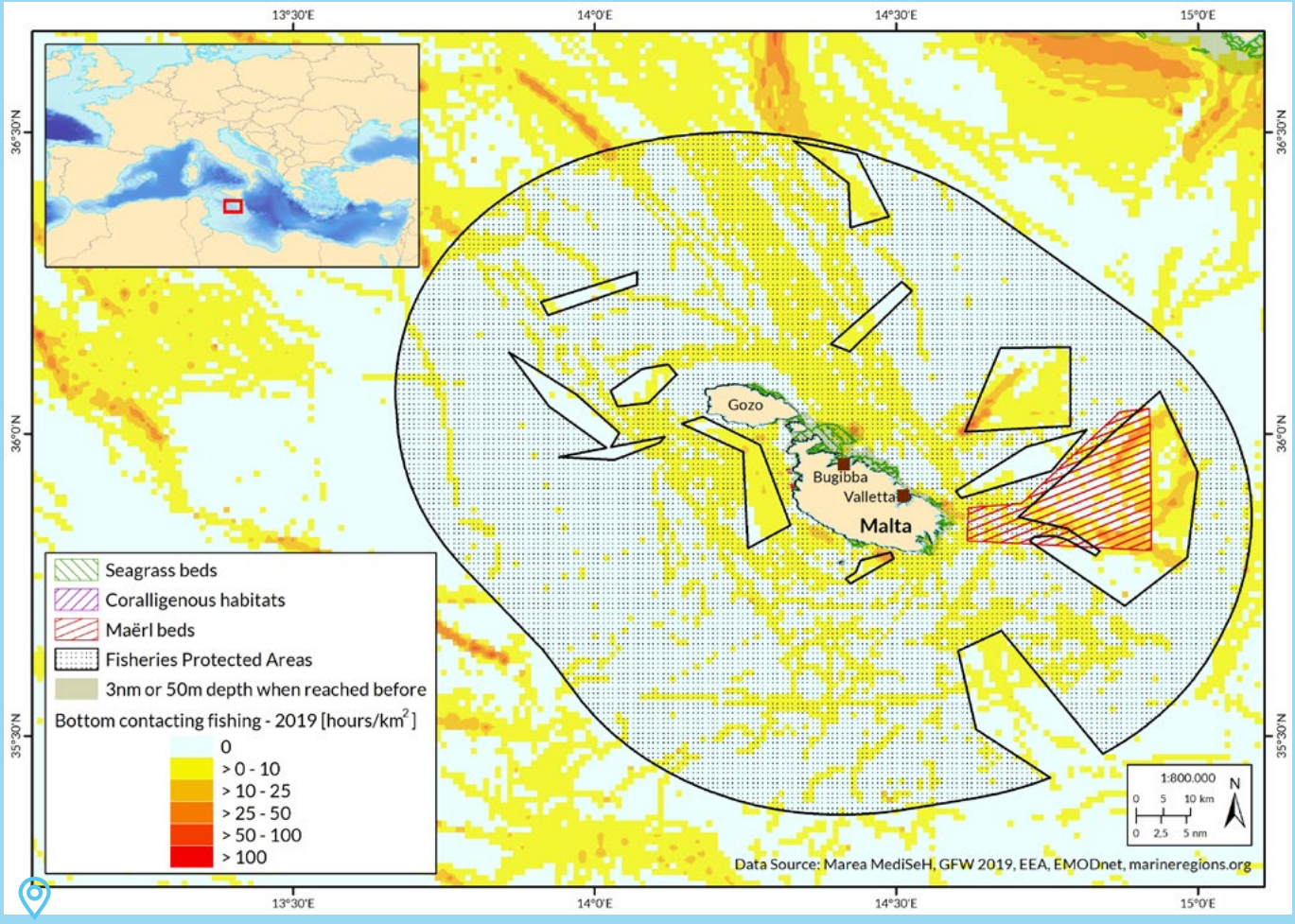

Figure 11.
Fisheries Management Zone in Malta, in relation to known areas of seagrass beds, coralligenous habitats, and maërl beds, and hours of bottom trawling in 2019.

Spanish FPAs in the Balearic Islands

The waters of the Balearic Islands harbour very well-developed coralline concretions, including coralligenous habitats and maërl beds, as well as dense *Posidonia* meadows. Research studies, such as those carried out under the LIFE+ INDEMARES project,[33] have documented and mapped in detail the distribution and status of protected habitats in the area, along with impacts of bottom-contacting fishing gear. Additionally, Oceana has carried out multiple expeditions to the area, documenting impressive maërl beds on top of Ausiàs March and Emile Baudot seamounts, along with a significant coralligenous reef at Fort d'en Moreu.[43]

Such clear evidence of the presence of these protected habitats, and detailed information about their distribution, resulted in the designation of two FPAs to protect these features against bottom trawling (see *Country analysis: Spain*).

Oceana's analysis of fishing activity in 2019 confirmed that bottom trawling is not occurring in most of the FPAs, with only a few signals from vessels. As shown in **Figure 12**, we detected some apparent bottom fishing activity inside the larger FPA in the Menorca Channel, mainly off the cities of *Capdepera*, *Alcudia* and south of *Ciutadella*. In contrast, we did not detect any bottom trawling in the smaller FPA located south of the Mallorca Channel or in the three sub-areas (Fort d'en Moreu, Emile Baudot and Ausiàs March), indicating that the FPA provides effective protection of the habitats against destructive fishing gear.

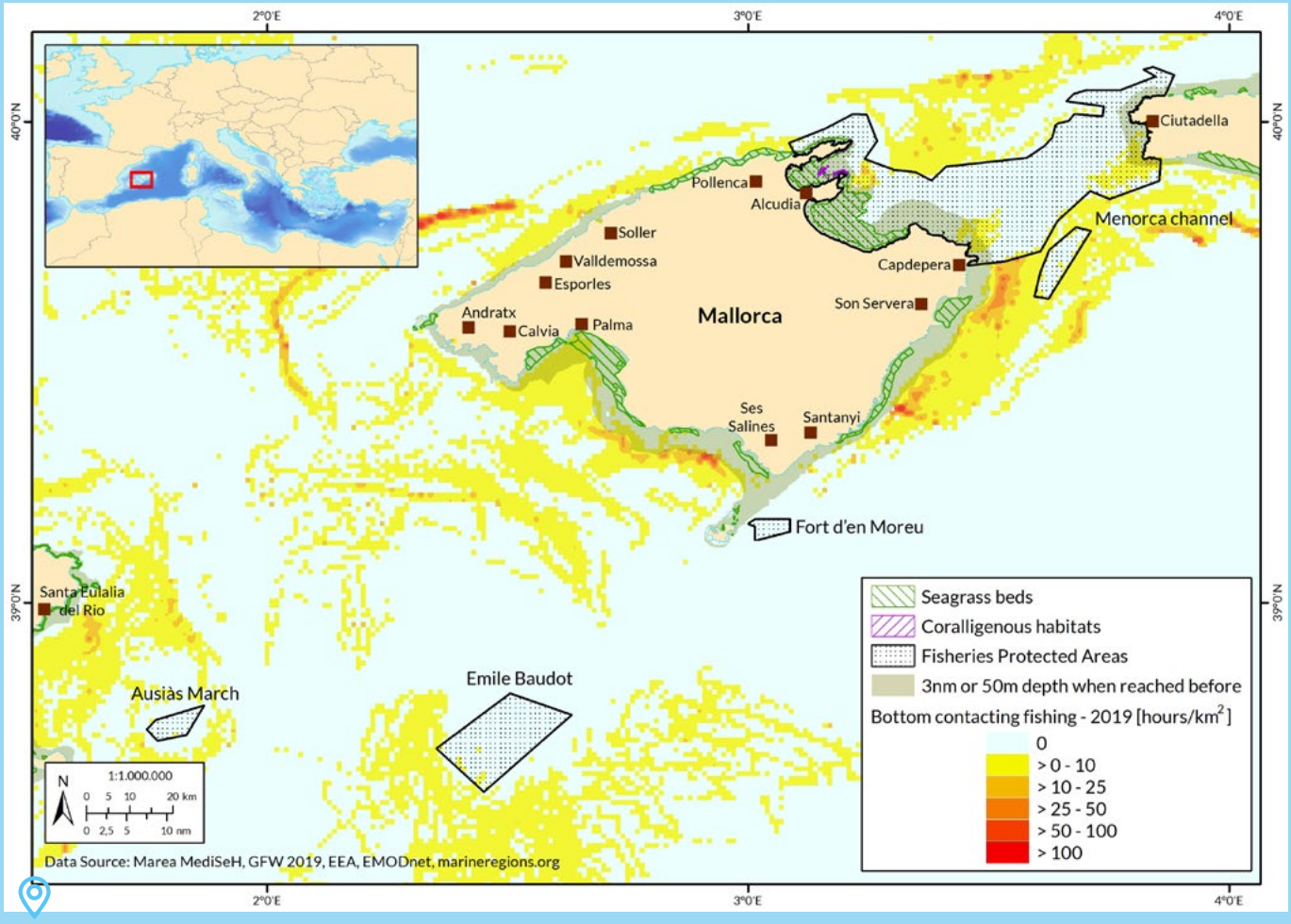

Figure 12.
Spanish FPAs in the Balearic Islands, in relation to known areas of seagrass beds, coralligenous habitats, and hours of bottom trawling in 2019.

Northern Adriatic (Italy)

This case study focuses on an intensively trawled area located in the northern Adriatic Sea, in the Veneto region. Specifically, we selected two *Zone di Tutela Biologica* (ZTB), reported as FPAs: *Porto Falconera* (one area of 6 km^2) and *Tenue Chioggia* (four areas totalling 60 km^2). Coralligenous beds have been mapped in this shallow part of the Adriatic Sea and are found in all five zones. These ZTBs were designated primarily to protect juvenile fish and strictly forbid the use of bottom trawling.

Oceana's analysis of bottom fishing activity in 2019 indicated that the ZTBs do not appear to serve as effective FPAs. **Figure 13** shows the 234 hours of bottom trawling that apparently occurred in 2019 inside the four zones composing the *Tenue Chioggia* ZTB. This intensity of bottom trawling within areas where it is legally prohibited indicates a lack of enforcement of the ZTB rules (*Decreto Ministeriale* of 16 March 2004,[44] and of 5 August 2002[45]). We observed little bottom fishing inside the *Porto Falconera* ZTB, probably because it is situated in shallow waters and is very close (roughly 1.5 km) to shore. Outside of the ZTBs, bottom trawling also occurred over all the other known areas of coralligenous habitats. Some of these 15 mapped areas had relatively high intense bottom fishing.

This case illustrates a worrying example of weak protection of coralligenous areas: the further away from the shore they are, the more intense the bottom trawling. This destructive fishing activity over coralligenous habitat is a clear infringement of the Mediterranean Regulation provisions and suggests that, despite research efforts to identify and map these areas, no actual protection exists. The only positive note is that we observed a relatively lower intensity of bottom fishing over the coralligenous areas inside the 3 nm zone from the coast.

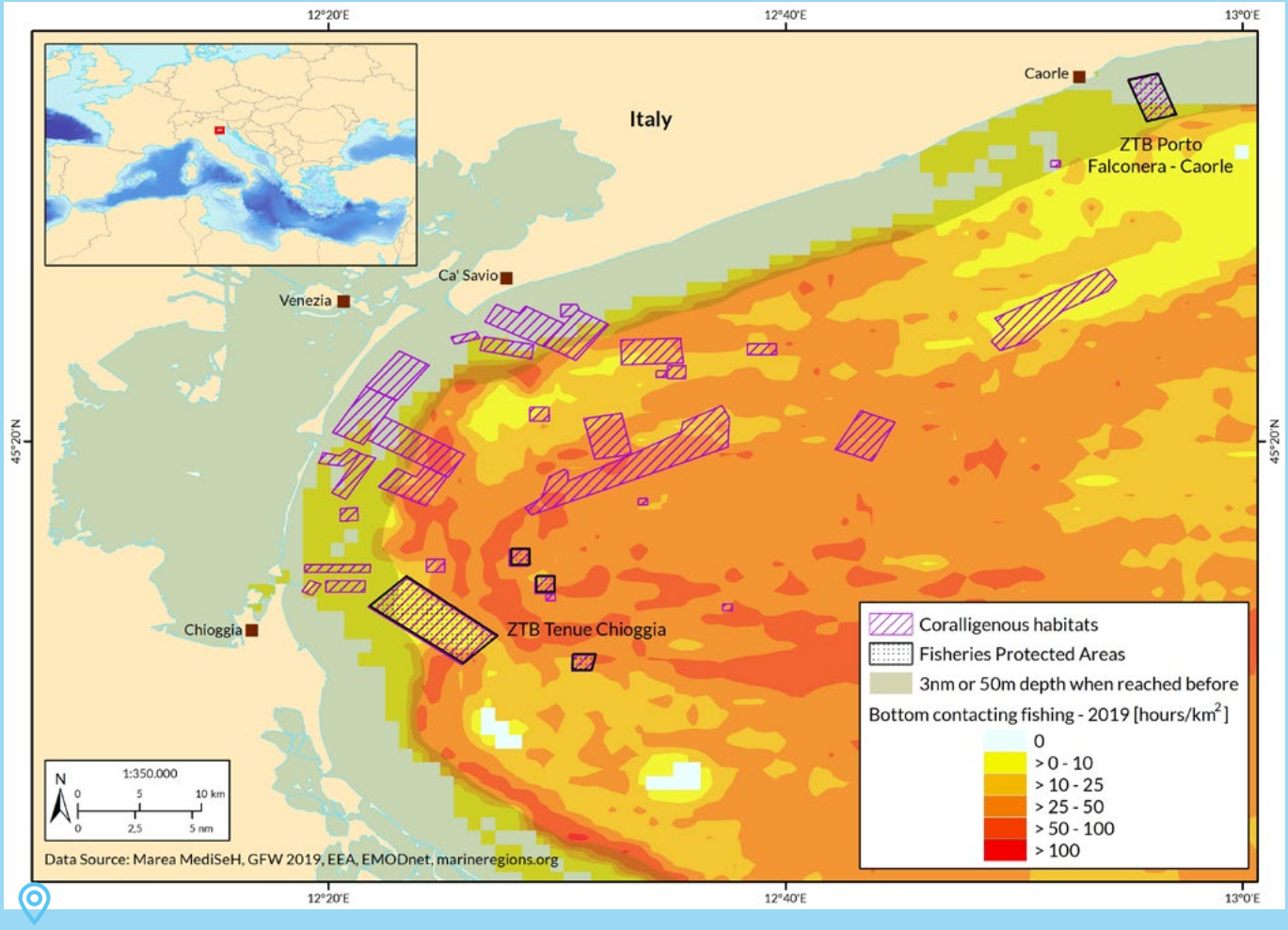

Figure 13.
Italian FPAs in Northern Adriatic, in relation to known areas of seagrass beds, coralligenous habitats, and hours of bottom trawling in 2019.

West of Sicily, Italy

This case illustrates an area without FPAs in place, where seagrass and coralligenous beds are mapped nearshore the Trapani province located on the Western coast of Sicily. We detected more than 90 vessels bottom trawling for 360 hours over sensitive habitats that are protected under the Mediterranean Regulation, primarily seagrass and to a lesser extent coralligenous beds.

Part of this activity occurred inside the 3 nm/50 m depth coastal area, prohibited for trawlers, over seagrass around the island of *Favignana*, in front of *Sciacca*, *Terrasini* and *Trapani*. In addition, we found trawling to occur over a coralligenous area located in front of *Mazara del Vallo* **(Figure 14)**. This case study demonstrates how expanding the coastal zone of protection further offshore would improve the protection of habitats, particularly coralligenous beds.

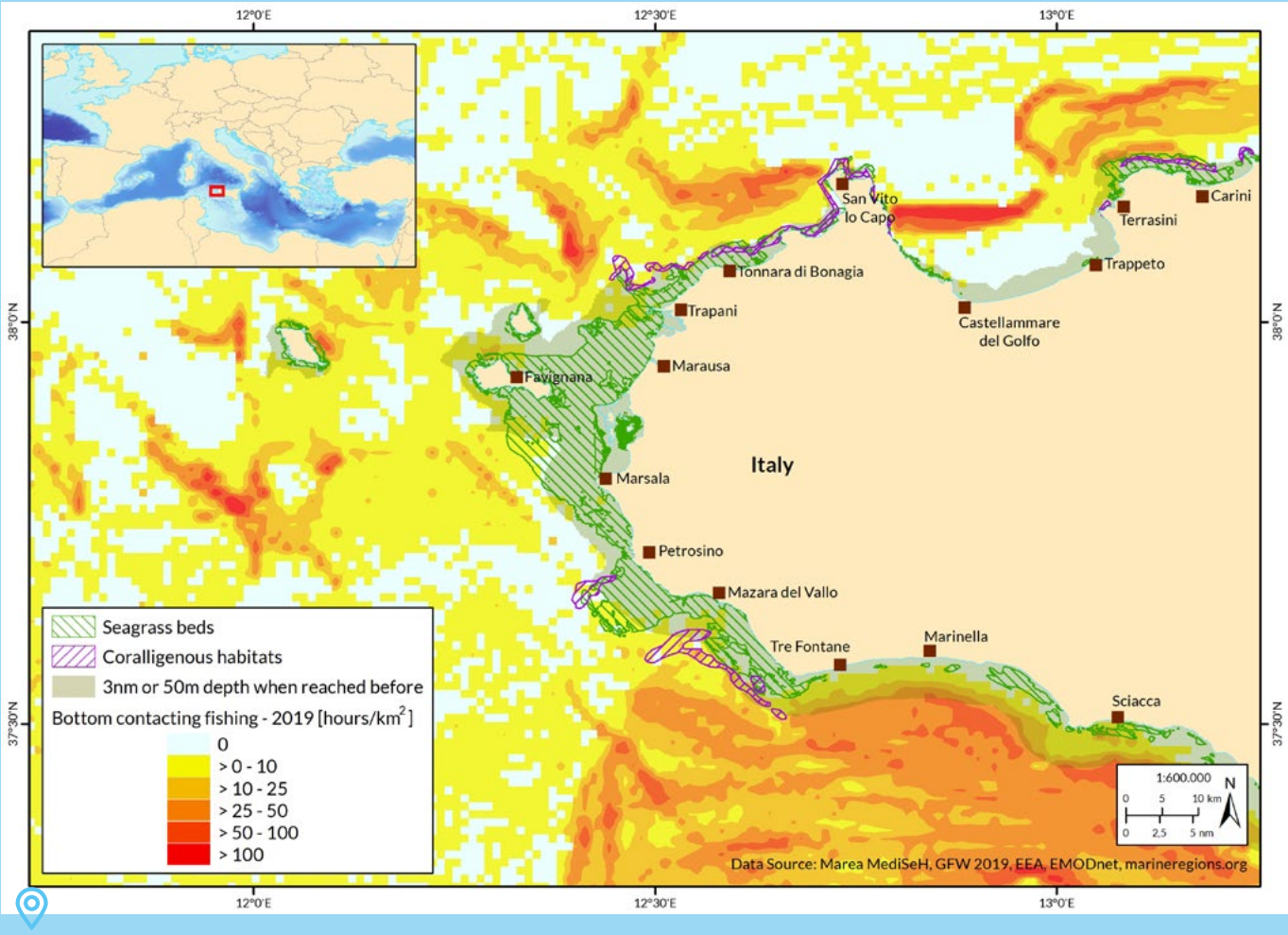

Figure 14.
Western Sicily, Italy in relation to known areas of seagrass beds and coralligenous habitats, and hours of bottom trawling in 2019.

Tuscany, Italy

This example off the Tuscany coast shows apparent bottom trawling occurring over maërl beds mainly. Oceana's analysis of bottom fishing activity in 2019 detected 20 vessels that fished for a total of 790 hours over these protected habitats, primarily in zones located near Piombino and to the west of Elba island **(Figure 15)**.

Important and well documented areas of Mediterranean maërl remain unprotected in these waters, such as those to the west of Elba, which cover roughly 450 km^2 at about 80 m depth. Some bottom trawling (approximately 130 hours) also occurred inside the ZTB *Area al largo delle coste dell'Argentario*, despite a prohibition on trawl fishing (*Decreto Ministeriale* of 22 January 2009[46]). On the other hand, the data on bottom fishing in 2019 suggest that seagrass and coralligenous beds are generally protected from trawling.

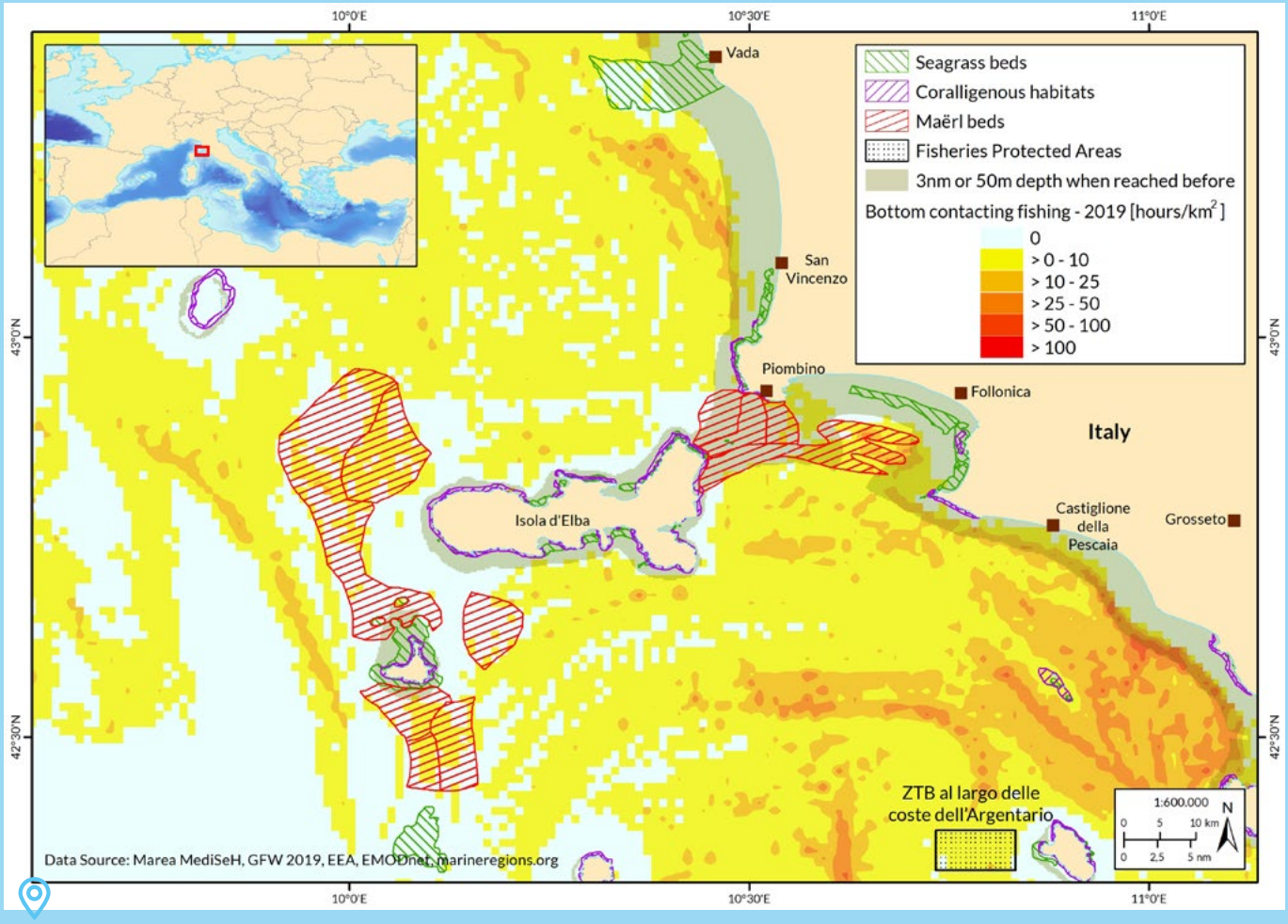

Figure 15.
Tuscany, Italy, in relation to known areas of seagrass beds, coralligenous habitats, and hours of bottom trawling in 2019.

Valencian coast, Spain

In 2019, bottom fishing activity was recorded within 3 nm south of Alicante (Comunidad Valenciana), over *Posidonia* meadows and patches of coralligenous beds (Figure 16). In total, we identified 26 vessels fishing for 82 hours over *Posidonia* beds, very close to the shore. The *Alicante* region has been specifically identified as one of the places in the Mediterranean where *Posidonia* meadows are in marked regression.[22]

Some bottom fishing also occurred over small coralligenous concretions identified in coastal waters **(Figure 16)**. As the sea bottoms here seem to be particularly sensitive to threats,[22] efforts should be made to avoid any destructive impact hindering achievement of the Mediterranean Regulation provisions on the protection of habitats and the restriction of fishing inside the 3 nm/50 m zone.

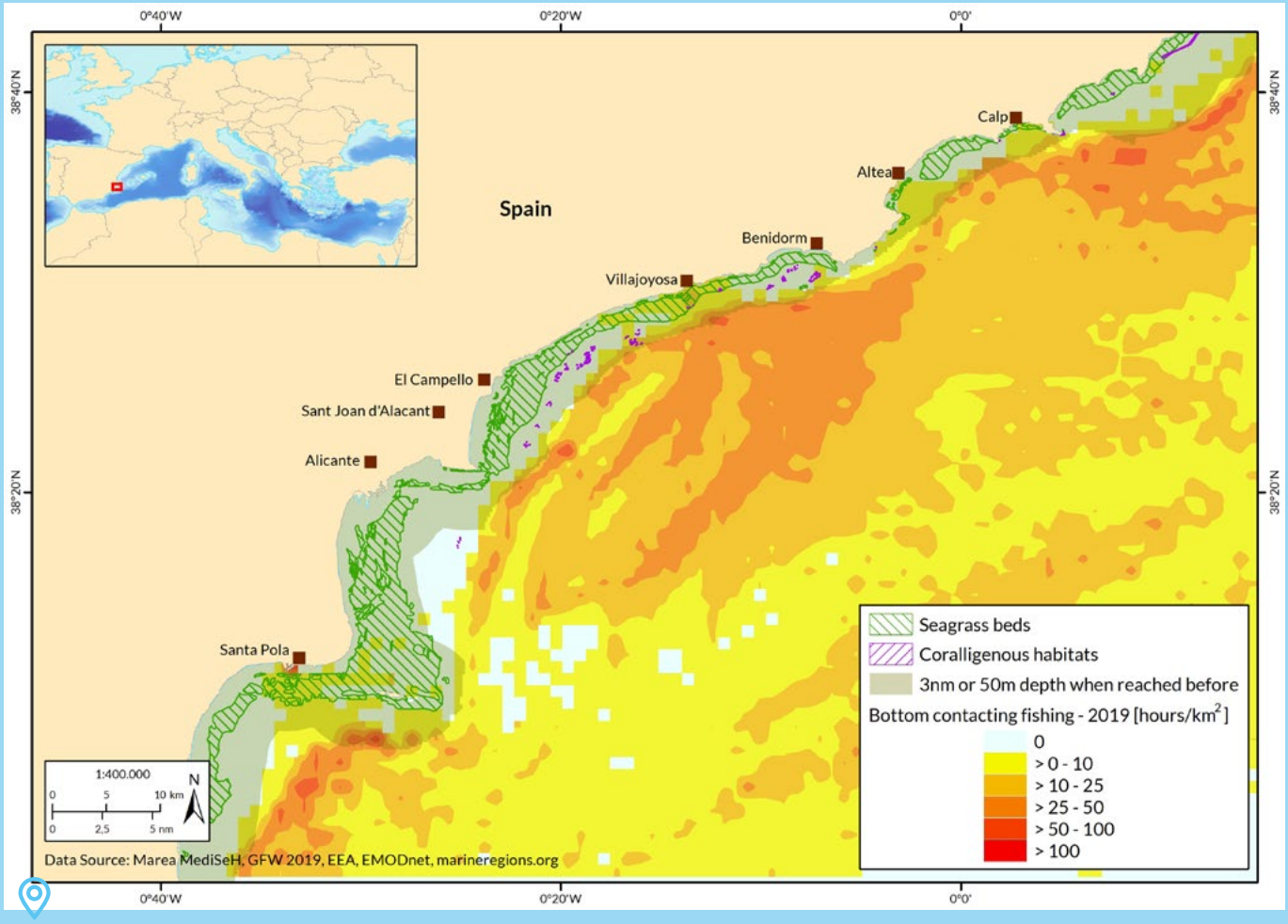

Figure 16.
Valencian coast, Spain, in relation to known areas of seagrass beds, coralligenous habitats, and hours of bottom trawling in 2019.

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8. Conclusions and recommendations

Almost 15 years after its adoption, the Mediterranean Regulation remains the cornerstone of fisheries management in the European waters of the Mediterranean Sea. This legislation laid out innovative rules aimed at protecting sensitive habitats and EFH - key habitats that support Mediterranean fisheries – and recognised the importance of the coastal zone and the threat posed by bottom-contacting fishing gears. Previous assessment of effectiveness of the Mediterranean Regulation have emphasised the relevance of some measures, such as spatial restrictions on fishing gears, but also weaknesses in implementation and compliance with its habitats protection regime. In 2019, the EC committed to evaluate the CFP by the end of 2022 and to identify how to address issues not sufficiently covered in the existing policy.[47] In view of the alarming state of European Mediterranean fisheries, it is critical to learn from the implementation of the Mediterranean Regulation, to ensure that marine habitats are being protected as intended. This should also guide future EU fisheries policy work and explore potential extensions of successful measures to other areas of EU waters, where for instance sensitive habitats are found and threatened by fishing activities.

Our analysis highlights key areas of weakness in the implementation of the Mediterranean Regulation, especially concerning the strict protection provisions of sensitive habitats. The basic protection of habitats is problematic as no precautionary measures exist to avoid bottom fishing across the entire known distribution of Mediterranean Regulation habitats. FPAs should offer even stricter protection, but to date no 'Community FPAs' have been designated, and very few real 'national FPAs' have been established specifically for habitat protection. Member States have reported FPAs, but two main weaknesses are apparent with the reported sites. First, most reported areas do not actually qualify as FPAs. For example, many of the areas reported to be FPAs are in fact Natura 2000 MPAs that lack fisheries management measures. Second, reporting included areas that had been designated prior to the entry into force of the Mediterranean Regulation and so could not deliver the specific objective of increased spatial protection of sensitive habitats. Furthermore, the necessary scientific justification for designating and reporting FPAs was generally not reported. Whereas the identification and mapping of sensitive habitats progressed rather well in the case of *Posidonia* beds, relatively few such efforts were carried out for coralligenous and maërl beds.

Most Member States only reacted to rare EC compliance follow-ups, often providing only partial or unclear information. Observations from the STECF evaluations of national management plans were also indications of weak implementation by Member States. In several instances, the STECF concluded that plans did not meet the Mediterranean Regulation requirements or that it could not formulate advice in the absence of supporting documents (this is particularly true for derogations). It is questionable as to whether the EC had enough indication of possible breaches of legislation to investigate and initiate infringement procedures against Member States. This perhaps would have allowed an early political awakening on the part of certain countries, followed by corrective actions.

Our spatial analysis of recent bottom fishing activities also indicates issues with the implementation of rules for protected habitats. Particularly worrying was Italy, which represented 76% of the total hours of trawling over habitats protected under the Mediterranean Regulation, followed by Malta, which accounted for 20% of such fishing. In Italy, fishing with towed gear occurred indiscriminately both inside and outside FPAs over mapped protected habitats, notably coralligenous and maërl beds. Trawling also took place inside the 3 nm/50 m coastal zone over mapped habitats, sometimes due to derogations, but nevertheless impacting sensitive habitats. To a lesser extent, an infringement on the coastal trawl ban was also identified in Spain, where bottom fishing occurred primarily over seagrass beds.

Our selection of case studies also emphasises differences in compliance related to FPAs. Compliance with trawl prohibitions inside Italian FPAs appeared to be lacking, while Spanish FPAs seemed to be largely effective in reducing and preventing trawling over sensitive habitats.

Similarly, the Maltese approach to fishing management indicates some efficiency in protecting sensitive habitats and regulating bottom trawling by concentrating it inside defined areas.

Oceana's analysis, together with the evidence of ongoing declines in Mediterranean coastal ecosystems, highlights the clear limitations of the Mediterranean Regulation management approach to protecting sensitive habitats. Instead of a patchy approach, relying on expensive and complicated data-acquisition, a more holistic and integrated approach is required to better protect sensitive Mediterranean habitats and deliver broader fisheries and biodiversity objectives. Broader scale spatial restrictions of bottom trawling in coastal areas would not only protect larger distribution of sensitive habitats and associated ecosystems, but it would also support coastal small-scale fisheries often operating with low-impact fishing gears, as well as strengthen resilience to climate change in coastal ecosystems by delivering higher seabed integrity and carbon storage.

Oceana therefore calls on the EC to introduce a **stricter prohibition on towed gear across the coastal waters of the Mediterranean – and wider European seas – without any possibility for derogations. This will deliver a triple win: for fish and fishers (particularly artisanal and low-impact fishers), for marine habitats and biodiversity, and for better climate resilience of coastal ecosystems.**

What follows are our specific recommendations to inform future Mediterranean fisheries policy, as well as any future revision of the Mediterranean Regulation:

- On the basis of the 2016 European Commission evaluation, the EC **should open infringement procedures and initiate legal action** against Mediterranean EU Member States that did not designate FPAs under Articles 5 and 7, particularly in relation to maërl and coralligenous habitats.

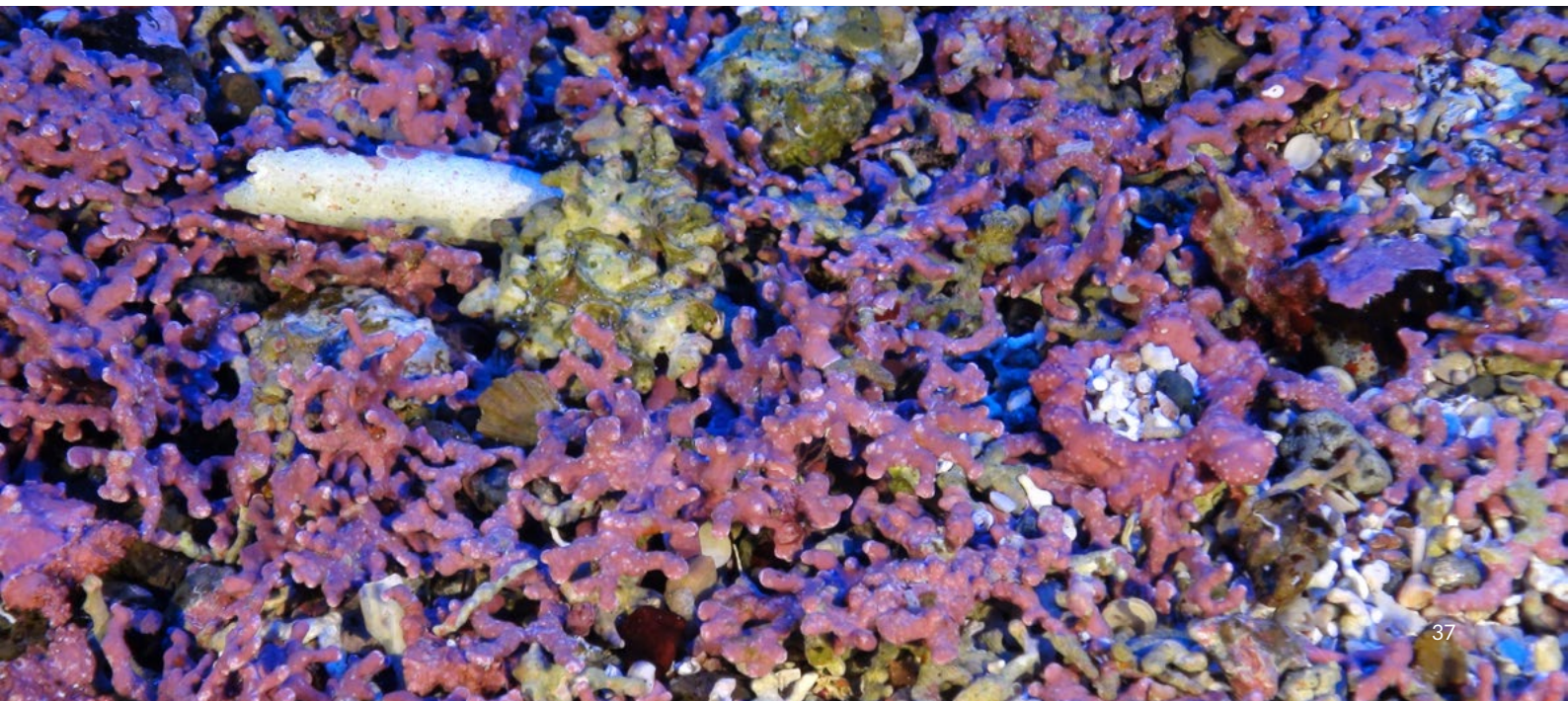
- The EC should **regularly assess the compliance and effectiveness with FPAs and report about implementation.** Since this has never been done, we call on the EC to do a comprehensive and objective evaluation, including an assessment of fishing activities inside FPAs.

- The EC should **follow more strictly the scientific evaluations and recommendation from the STECF and put in place precautionary mechanisms to ensure scientific concerns and reservations, including the inability to provide scientific advice because of lack of data, is properly integrated in decision making**. The EC should consequently reject any proposals lacking scientific justifications presented by national administrations.

- **Member States and the EC should establish trawl-free zones in coastal waters, by extending the current ban on towed gear within at least 10 nm of the coast or within the 150 m isobath** where that depth is reached at a shorter distance from the coast, in order to better protect the full distribution of coralligenous and maërl beds. This would protect almost the totality (about 96%) of the three Mediterranean Regulation habitats combined, instead of 78% currently (Table 3).

- **Establish precautionary buffer areas** around known sensitive habitats to better protect their ecological functions from the impact of human activities in adjacent areas, such as increased turbidity or plumes of sediment that can smother habitats and associated species. Buffers should be defined according to the characteristics of the habitats and areas (e.g., substrate, hydrodynamics).

- **Cancel all derogations for using towed gear over protected habitats**, as they undermine the main objective of conservation. Worse, they create loopholes that enable EU Member States to permit the use of the most destructive fishing gear type over sensitive habitats that can be permanently damaged after the passing of just one trawler.



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