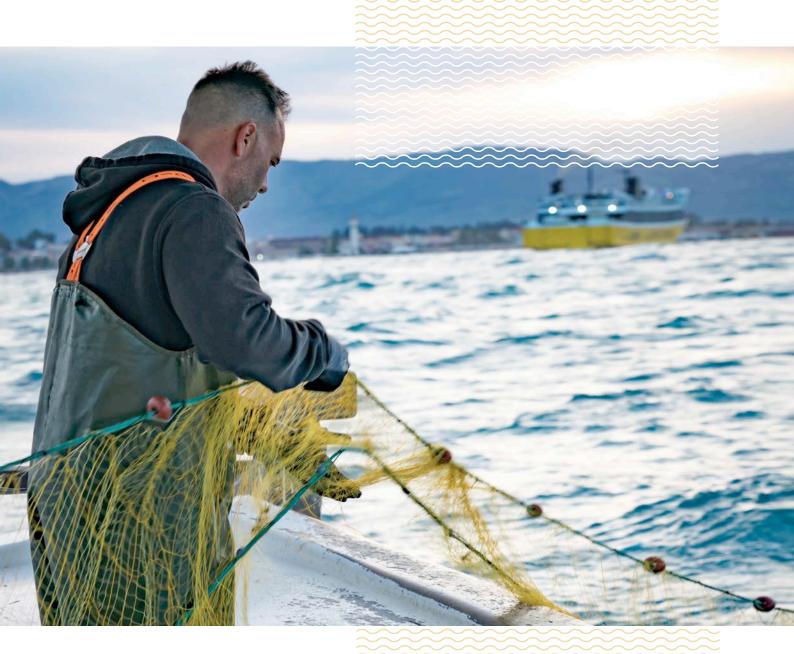


#### PHAROS4MPAS

# SAFEGUARDING MARINE PROTECTED AREAS IN THE GROWING MEDITERRANEAN BLUE ECONOMY





RECOMMENDATIONS FOR SMALL-SCALE FISHERIES

**Front cover:** Fishermen in Zakynthos MPA (Greece) with a cruise ship in the background © Claudia Amico / WWF

#### **Publication**

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# **EXECUTIVE SUMMARY**

Mediterranean fisheries are facing serious challenges due to over-exploitation. About 80% of all assessed stocks are fished outside safe biological limits, catches are decreasing, and regional fleets are shrinking (SoMFi 2018). Environmental degradation, coastal development and pollution are putting further pressure on fish stocks, while climate change is modifying the spatial distribution and productivity of marine species across the Mediterranean. Professional fishery landings have been declining for the past 20 years.

Small-scale fisheries (SSF) still make up most of the commercial fishing sector in the Mediterranean, both in terms of number of boats (83% of the total fleet) and of people employed (57% of the total workforce). The sector encompasses a wide range of fishing techniques, targets a large number of species, and uses many different landing sites all along the coasts.

Although SSF have been present for millennia in the Mediterranean, the sector today only has limited representation at national and regional level. Nevertheless. during the last decade there have been serious efforts to improve its regulatory framework. These include an FAO-GFCM Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF), supported by a Ministerial Declaration in 2018.

Since marine protected areas (MPAs), marine Natura 2000 sites and sites subject to other effective area-based conservation measures (OECM) are mostly found in coastal and shallow areas of the Mediterranean, their interaction with the SSF sector is inevitable. With this in mind. it's crucial that the benefits and impacts of the SSF sector on MPAs are scrutinised, and that the SSF community. MPA managers and public authorities work together to manage the interaction as carefully as possible.

It is clear that some MPAs should be kept entirely free of fishing activity. However, collaboration with the SSF community is very much needed to manage, monitor and protect MPAs more generally – and likewise to benefit SSF by strengthening stocks and improving returns on landings.

To facilitate this collaboration, public authorities should decentralize governance in fishery management, and encourage a participatory approach in MPA management. There are already good available tools to help with the task.

Case studies show that sustainable SSF can be successful in MPAs. The political will to support the idea is already there, so now it's up to all stakeholders to fight for a positive future.



# INTRODUCTION

Over the last 15 years, small-scale fisheries (SSF) have declined in the Mediterranean. Decades of overfishing and mismanagement have severely degraded the marine resources of the Mediterranean, with over 80% of assessed stocks being overfished. This is also threatening the survival of small-scale fishers and their families whose livelihoods and income depend on dwindling catches.

During the same period, Mediterranean marine protected areas (MPAs) have grown in number and size. These MPAs are a key tool for conservation, but their individual effectiveness is highly dependent on how well they integrate with their specific local conditions. Globally, interactions between MPAs and SSF have been increasing, and the same is true in the Mediterranean.

While SSF play a key economic and social role in Mediterranean coastal areas, they can also have significant environmental impacts on fishery resources and ecosystems. Depending on their location and the fishing gear used, SSF can also be a threat to specific species – these include elasmobranchs (sharks, rays and skates), marine mammals, turtles and birds. In addition they can harm sensitive habitats such as seagrass meadows (Posidonia oceanica), coralligenous reef assemblages and deep rocky seabeds.

How SSF can work sustainably in MPAs is an important question. While the designation of coastal MPAs has created new constraints for fishers, they also see that they share many of the same objectives as MPA managers, most obviously the recovery of fish stocks. Collaboration between them offers real possibilities for success: numerous examples illustrate how MPAs and local fishing communities working closely on the governance and management of SSF can achieve biodiversity and marine ressources' recovery. Actually, past experiences, multi-stakeholder projects, have taught us that co-management is the way forward.

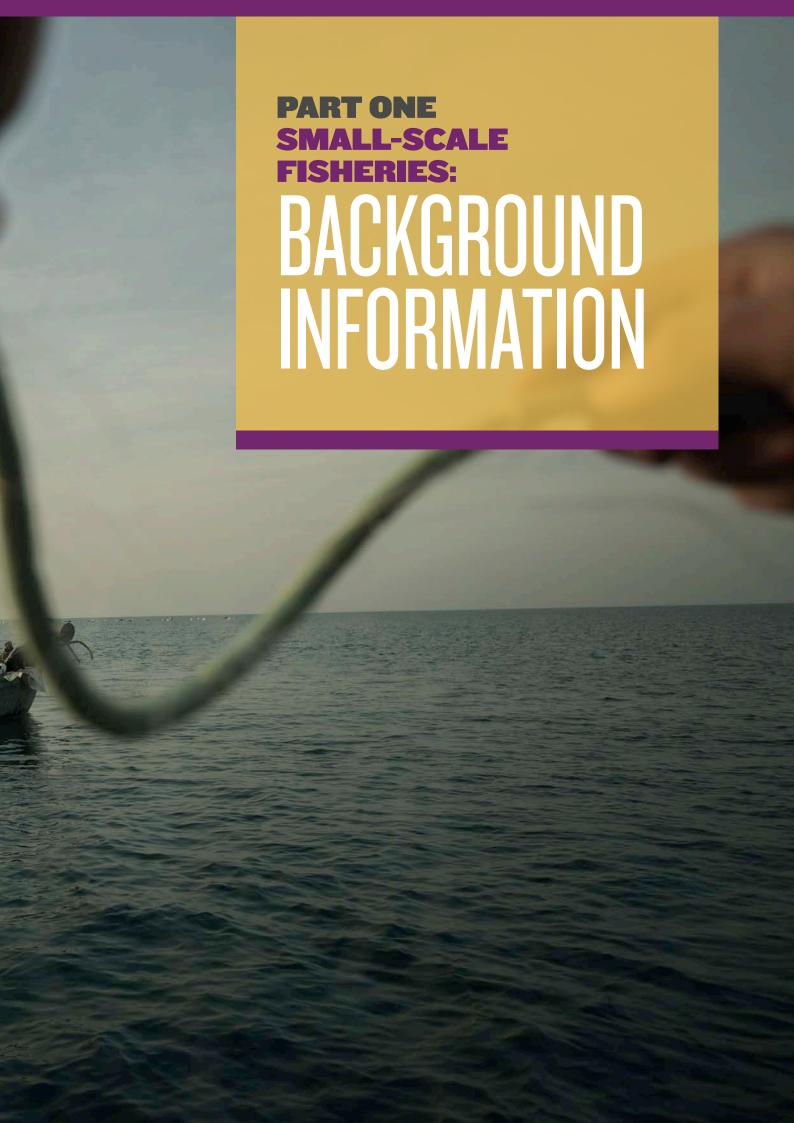
This report provides a brief but practical reference guide to current thinking on the subject for public authorities, MPA managers and the SSF sector. The aim, ultimately, is to help achieve the long-term sustainable use of marine resources.

The PHAROS4MPAs project explores how Mediterranean MPAs are affected by activities in the growing Blue Economy, and provides a set of practical recommendations for regional stakeholders on how the environmental impacts of key sectors can be prevented or minimized. Encouraging international collaboration across MPA networks and cooperation between state, industry and other actors, PHAROS4MPAs aims to enhance MPA management effectiveness and improve the conservation of marine ecosystems across the whole of the Mediterranean.

PHAROS4MPAs focuses on the following sectors of the Blue Economy:

- Maritime transport and industrial ports
- Cruise
- Leisure boating
- Offshore wind farms
- Aquaculture
- Recreational fisheries
- · Small-scale fisheries





# 1.1. COMMERCIAL FISHERIES IN THE MEDITERRANEAN

Commercial fishing activities in the Mediterranean Sea are an important source of nutrition, employment and income for coastal populations. However, Mediterranean fisheries are facing serious challenges due to over-exploitation: around 80% of all assessed stocks are fished outside safe biological limits, catches are decreasing, and regional fleets are shrinking [1].

In addition to fishing pressure Mediterranean fish stocks are also being threatened by environmental degradation, coastal development and pollution; while climate change is modifying the spatial distribution and productivity of marine species.

Figure 1 shows potential major fishing areas in the Mediterranean Sea.

According to the GFCM <sup>[1]</sup>, the commercial fishing fleet in the Mediterranean consisted of some 74,900 vessels with total landings of around 850,000 tonnes in 2016.

Marine capture fisheries in the Mediterranean produce an estimated annual revenue of USD 2.44 billion [1]. However in real terms this figure is likely to be higher, as a significant portion of the Mediterranean fish catch is not sold through regulated markets.

As far as Mediterranean landings are concerned, Italy is the main producer (22%). Other countries that contribute at least 5% of total captures are Tunisia (14%), Algeria (12%), Spain (9%), Croatia (9%), Greece (8%), Turkey (8%) and Egypt (7%)[1].

Total employment in the commercial fisheries sector in the Mediterranean was estimated at around 227,250 jobs in 2018. Polyvalent vessels (which use more than one kind of gear) provide the largest share of jobs (59%)<sup>[1]</sup> – the number of fishers engaged in SSF is considerable.

In the Mediterranean small-scale fishing has different characteristics in different locations and countries, but it also shares common elements across the region. The SSF sector usually operates near the coast, where in many countries bottom and pelagic trawling is banned, so the use of passive gear is particularly important. Traditionally, the profession at this scale has been organised into small family-sized businesses.

SSF account for around 80% of the Mediterranean fleet, with some 60 000 vessels (Figure 2). These brought in USD 519 million (24%) of the region's commercial fishing revenue in 2017<sup>[1]</sup>.

SSF are often allowed to operate in a regulated manner within MPAs, while industrial fisheries are in general not permitted. For this reason, this report focuses on small-scale fisheries.

## 1.2. **DEFINITION OF SMALL-SCALE FISHFRIFS**

While no definitive statistics exist, the FAO estimates that the small-scale sector employs 50 million of the world's 51 million fishers<sup>1</sup>. They are mostly in developing countries, supply most of the fish consumed in the developing world, and are responsible for nearly half of the world's total fish production.

Due to the sector's diversity, trying to agree a workable definition of SSF has been a recurrent challenge in global, regional and even national policy debates.

According to the EU definition, 'small-scale coastal fishing' means fishing carried out by vessels of an overall length of less than 12 metres and not using towed fishing gear, including surrounding seines, beams and trawls (as listed in Table 3 of Annex I to Commission Regulation (EC) No 26/2004).

The GFCM, on the other hand, characterizes fishing fleet segments mainly on the basis of vessel length<sup>2</sup> [2], with SSF falling under the category of 'polyvalent vessels and longliners under 12m'. However, it is developping a more accurate definition of SSF, based on detailed characteristics relating to 13 topics such as size of fishing vessel, mechanization, gear, ownership, disposal of catch, etc 3[1].

The term 'artisanal fishing' is often equated with 'small-scale fishing' (the latter is more frequently used by English speakers), even though there are some subtle differences between the two terms. Small-scale fishing may appear more precise, but it is also more limited in scope than the 'artisan' notion. In this publication, we will use only the term small-scale fishery (SSF) - this will avoid confusion, and also reflects the fact that 'artisanal' as a term is generally not recognised in national legislation.

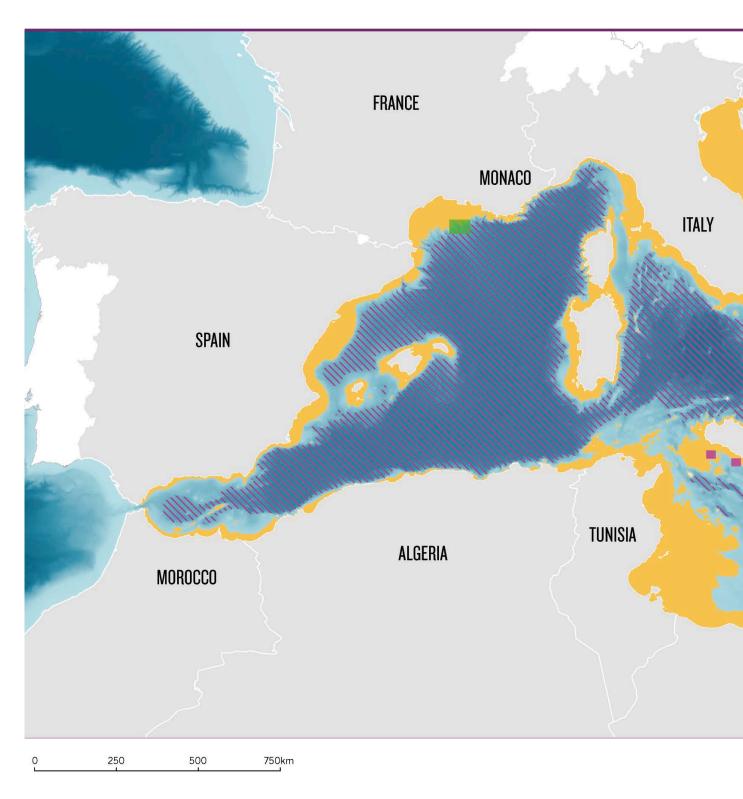
Some argue that the SSF definition should include a social element, highlighting the historically community-based organisation of the sector and the fact that SSF maintain a clear cultural and sometimes traditional dimension [3].

In this report, we mainly use the EU definition (Regulation (EU) No 508/2014), excluding a number of towed gears that are widely considered as incompatible with MPA conservation objectives.

<sup>&</sup>lt;sup>1</sup> For more information refer to www.fao.org/fishery/ssf/people/en

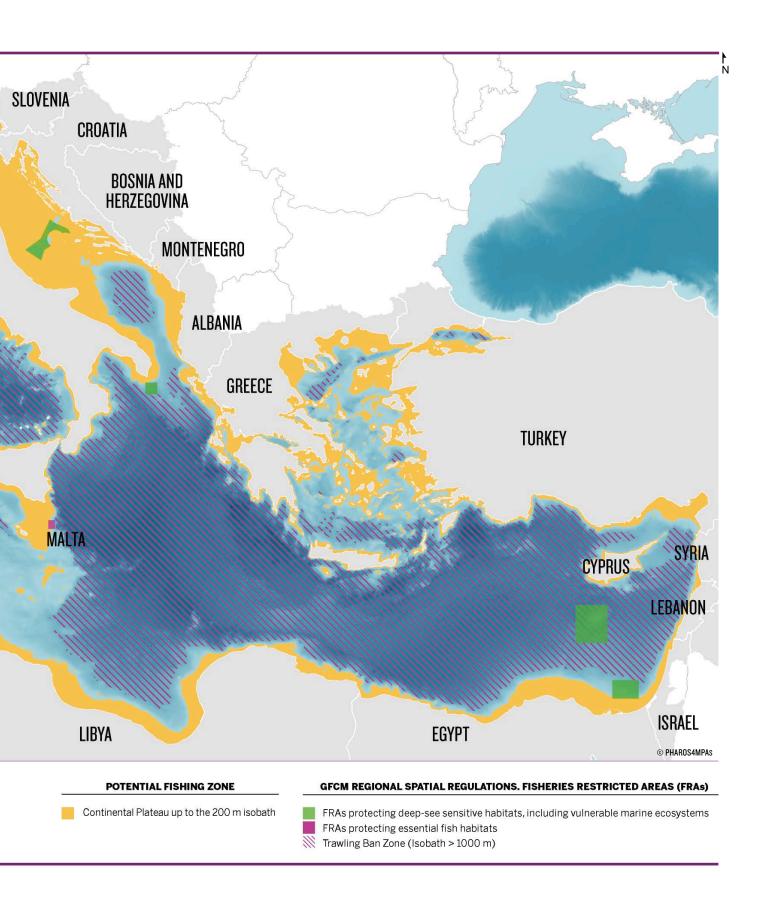
<sup>&</sup>lt;sup>2</sup> Fleet segments characterization: Polyvalent SS w/o engine < 12 m represents all vessels less than 12m in Length Overall (LOA), without an engine (wind or propulsion), using different gear; Polyvalent SS w/ engine < 6 m LOA represents all vessels under 6m LOA, with engine, using different gear; Polyvalent SS w/ engine 6-12m LOA represents all vessels between 6 and 12 m LOA, with engine, using different gear (The GFCM definition includes the gears' specifications for each engine

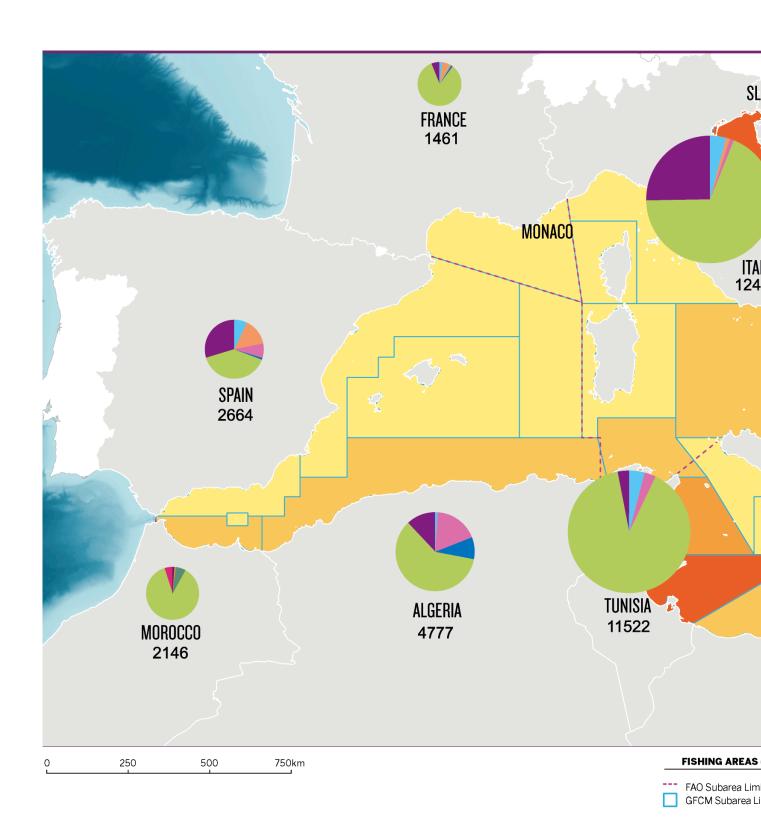
<sup>&</sup>lt;sup>3</sup>Recommendation on the submission of data on fishing activities, Recommendation GFCM/41/2017/6



SOURCE: EMODNET (2016) & GFCM (2019)

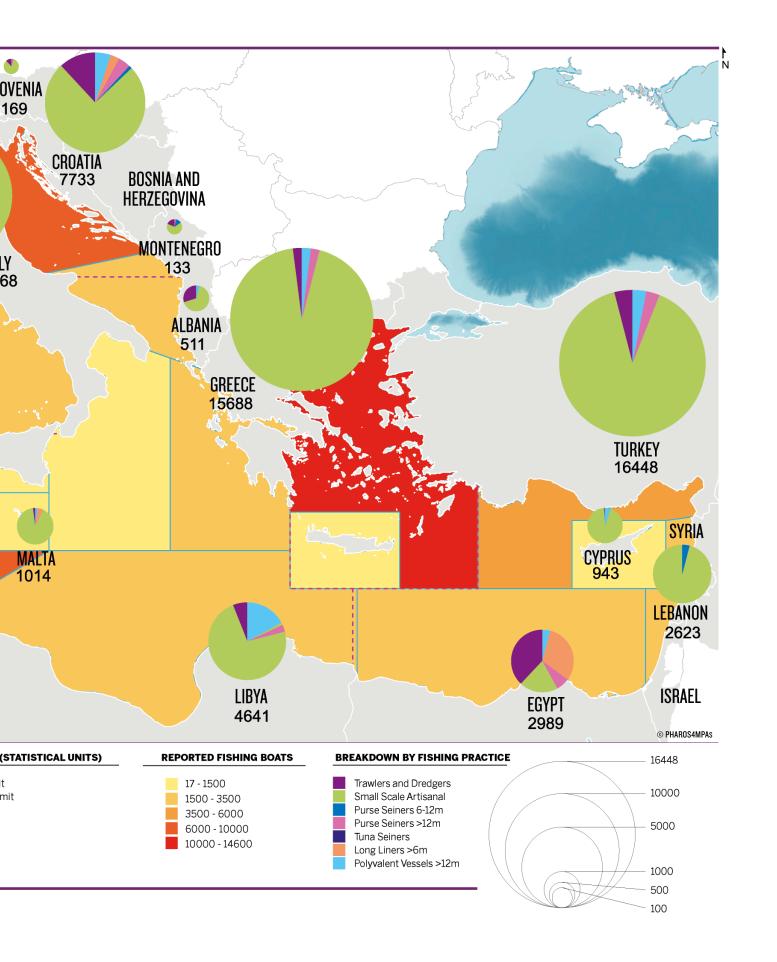
**FIGURE I.** Continental plateau up to the 200m isobath, reflecting major potential fishing areas in the Mediterranean Sea, and spatial regulations adopted by the General Fisheries Commission for the Mediterranean (GFCM) between 2005 and 2018: the deep-sea trawling ban area under 1000m as well as nine Fisheries Restricted Areas.





SOURCE: SoMFi, FAO (2016, 2018)

**FIGURE 2.** Number of fishing vessels in GFCM sub-areas and breakdown of fishing vessels by fishing practice group and country



# THE COMPLEXITY AND CHALLENGES OF SMALL-SCALE FISHERIES IN THE MEDITERRANEAN

SSF use many different techniques and more than 50 types of fishing gear to target species, often switching among them during a fishing trip. Fishing seasons are based on a rotatory system between different target species and varied opportunistic approaches depending on the available marine resources. Gillnets and trammel nets are the main

gear used, but droplines, trolling lines, handlines, longlines, set nets of several kinds, pots, traps, etc. are also used. Although SSF target a large number of species, only a few account for most of their landing value. These species vary according to the Mediterranean sub-region, as shown in Figure 3<sup>[1]</sup>.

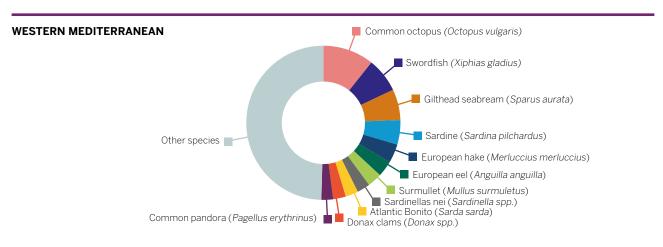
SSF landing sites are widespread along the coasts and in fishing ports, which makes effective monitoring, control and surveillance (MCS) extremely challenging. The heterogeneity of markets and points of sales adds further complications to the assessment of the sector.

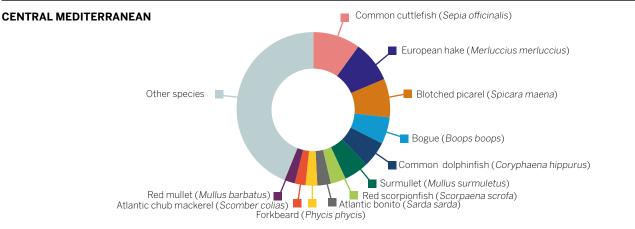
In addition, the governance of the sector is very fragmented, and SSF have limited representation both at national and regional level.

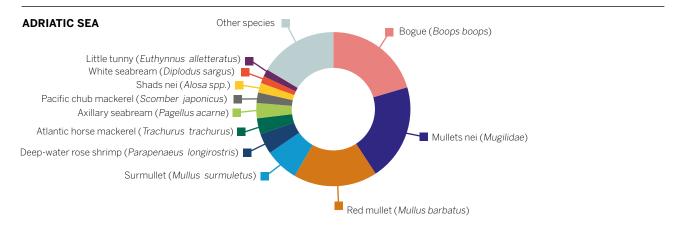
The SSF sector has been declining across the Mediterranean since the year 2000 <sup>[4,5]</sup>. Although SSF vessels are still responsible for the majority of commercial fishing activities in the region, between 2008 and 2018 their estimated numbers fell from around 68.000 <sup>[6]</sup> to 60.000 <sup>[1]</sup>.

At the same time small-scale fishers are getting progressively older, which raises questions about the future of the profession. Many are over 50 years old<sup>[7]</sup>, and their younger peers represent only a small fraction of the fleet, often between 5 and 20% <sup>[8,9,5]</sup>.









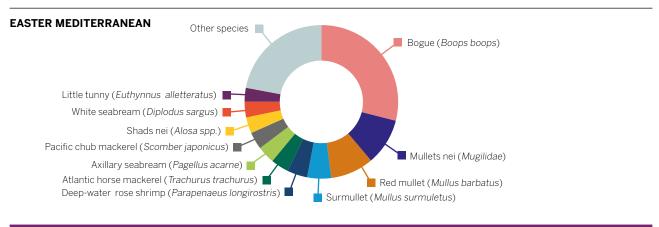


FIGURE 3. Share of landing value by species in the four GFCM Mediterranean subregions (SOMFI, 2018)

### **1.4.** REGULATORY FRAMFWORK

The management of fisheries at the Mediterranean Sea scale is carried out by two Regional Fisheries Management Organizations (RFMOs), namely the General Fisheries Commission for the Mediterranean (GFCM) and the International Commission for the Conservation of Atlantic Tunas (ICCAT). Their work is also greatly influenced by the EU through its Common Fishery Policy (CFP).

Small-scale fishers have long been asking for their activities to be explicitly recognised and taken into account in general fisheries policies. While some progress has been made in recent years, this issue overall still remains a challenge: policies are usually geared to large-scale industrial fisheries, and in Europe Atlantic fisheries have disproportionate influence.

#### **FAO GUIDANCE**

To guide the sustainable development of the SSF sector globally, Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries were endorsed by the FAO Committee on Fisheries (COFI) in June 2014. The SSF Guidelines complement the Code of Conduct for Responsible Fisheries which, alongside the fishing provisions of the UN Convention on the Law of the Sea, is the most widely recognized and implemented international fisheries instrument.

Further progress at a regional scale was made in 2018, with the approval of an FAO-GFCM Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF) supported by a Ministerial Declaration. This action plan contains concrete actions to be carried out over the next 10 years (until 2028) aiming to grow the long-term environmental, economic and social sustainability of SSF.



#### **EUROPEAN LEVEL**

Overall, the SSF sector has been receiving increasing attention in the Mediterranean over the last 10 years.

At EU level, it should be noted that the Common Fisheries Policy (CFP) contains concrete measures geared towards the small-scale sector and its sustainable development. To summarise:

- 1) Member states are encouraged to consider preferential or exclusive access for SSF along the coast, underlining the selectivity and low impact of the techniques employed.
- 2) Fishing opportunities will not only be allocated according to the seniority of the fishers, but also on the basis of environmental and social criteria.





Roughly 80% of all assessed stocks are fished outside safe biological limits, catches are decreasing and fleets shrinking at the regional scale.



The fishing fleet in operation in the Mediterranean and the Black Sea consists of around **86,500** vessels, of which the majority are small-scale fishing boats.

SSF include many fishing techniques and use more than 50 types of fishing gear to target species and adapt to fishing seasons.

SSF use widespread landing sites and numerous fishing ports, which means it is extremely challenging to effectively perform monitoring, control and surveillance activities.

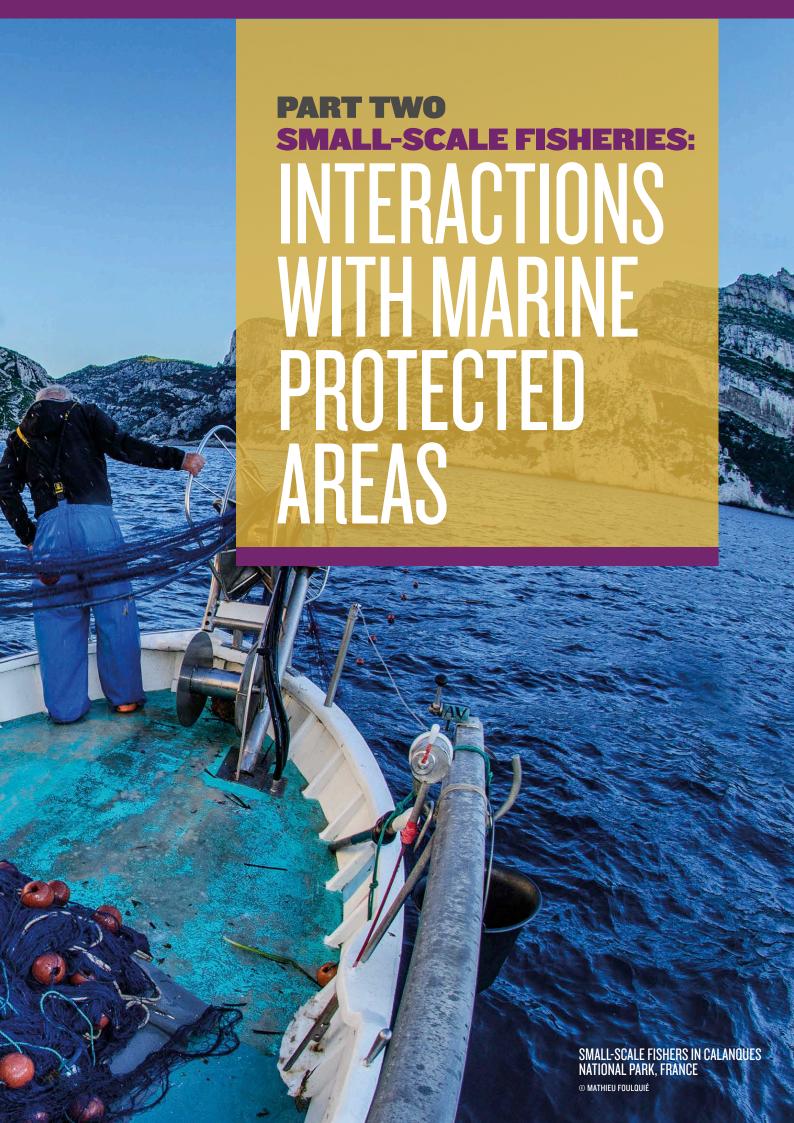


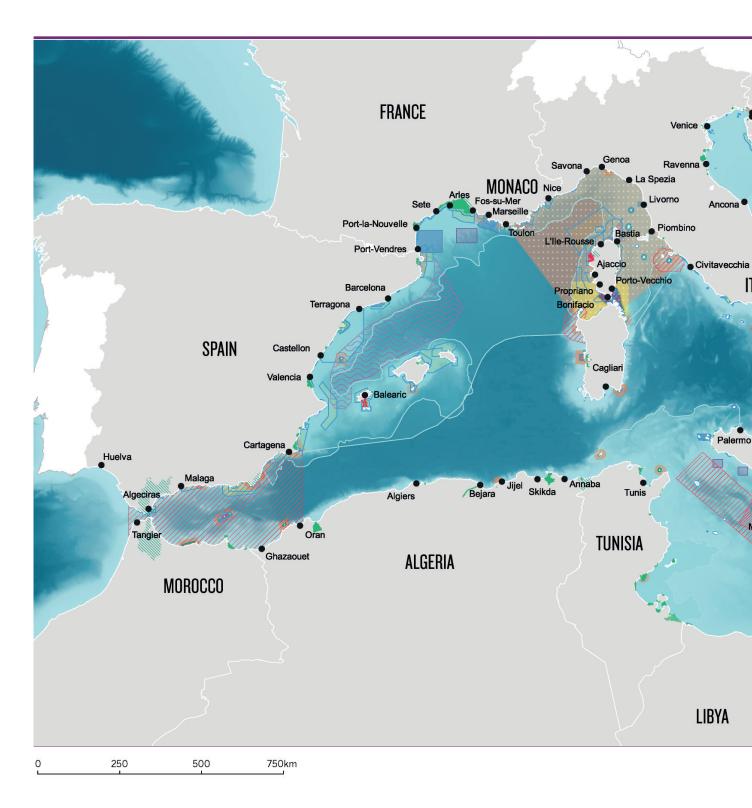
However, these policies may not necessarily be reflected at a national scale: regulatory frameworks governing SSF are very diverse and not always supportive of this highly varied and fragmented activity [3].

The **European Commission** has recently published a proposal to amend the Control Regulation to better control SSF, but this is still under discussion. It includes new demands on small vessel operators, such as a provision that all vessels including those shorter than 12m must have a tracking system. Also under discussion are requirements to maintain an electronic logbook, and to weigh catches separated by species at the time of landing. Landing unsorted species is only to be allowed if strict conditions are met, including weighing by systems operated or controlled by Member State authorities. Small operators are also required to take note of strict new provisions on infringements and sanctions, including a new penalty points system.

Fisheries are also addressed at EU level in relation to the marine Natura 2000 network under the Habitats Directive, which seeks to ensure the conservation of biodiversity in the EU. In order to maintain or even restore the good conservation status of natural habitats and of wild fauna and flora. it is important to prevent activities which could harm them. Article 6(3) applies specifically to potential plans or projects in Natura 2000 sites, introducing the requirement to undertake an assessment of their impacts. Certain fishing activities are likely to have significant negative effects on the marine environment, so they fall under this requirement.

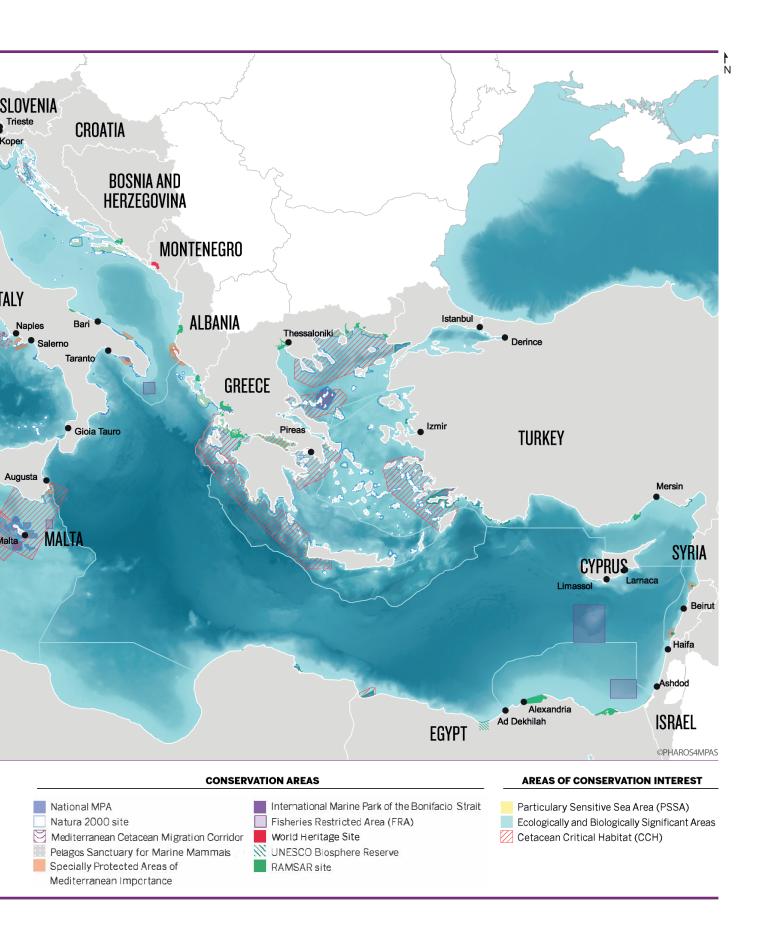




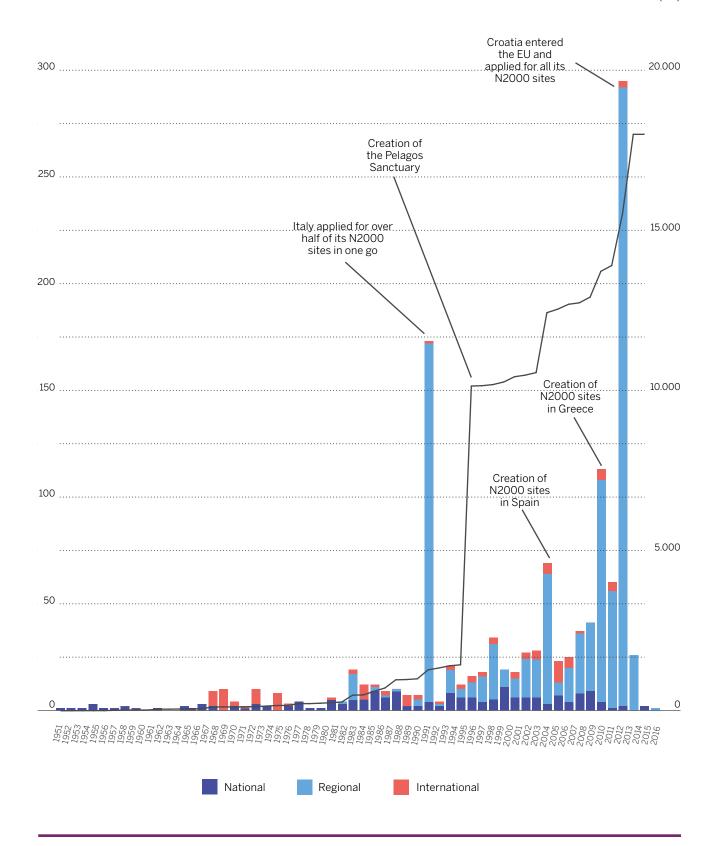


SOURCE: MAPAMED, MedPAN & UNEP-MAP-SPA/RAC (2017)

FIGURE 4. Different types of protected areas in the Mediterranean Sea



NUMBER OF SITES SURFACE COVERED (KM)



**FIGURE 5.** Number of MPAs and marine Natura 2000 sites created per year by type of designation (national, regional and international) and cumulative surface areas from 1950 to 2016 (MEDPAN, 2016)

The 2016 Status of Marine Protected Areas in the Mediterranean provides a region-wide analysis of the progress of the basin in terms of marine protection [10]. Since the 1950s, the Contracting Parties of the Barcelona Convention have established different MPAs and other effective area-based conservation measures (OECMs). Figures from 2016 show there are 1,231 MPAs and OECMs in the Mediterranean Sea covering 179,798 km²: this places a surface of 7.14% under a legal designation (Figure 4).

These sites are designated under a wide variety of designations, such as national parks, marine reserves, no-take zones, SPAMIs etc.

Figure 5 shows the number of MPAs and marine Natura 2000 sites created per year by level of designation (national, regional and international) and cumulative surface area covered from 1950 to 2016.

Using the criteria of the 2016 Status report, there are 186 MPAs designated at national level specifically which cover 1.6% or 40,327 km² of the Mediterranean Sea. Of these nationally designated sites, 76 have at least one no-go, no-take or no-fishing zone, which between them cover 0.04% of the Mediterranean Sea (976 km²).

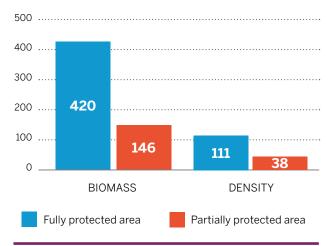
The Convention on Biological Diversity (CBD) has a 10% marine protection objective by 2020, known as the CBD Aichi target 11. In the review of the CBD targets for the next decade, this objective is likely to increase. The Tangiers Declaration in 2015 recommended that no-take reserves should cover at least 2% of the Mediterranean by 2020.

The SSF sector has existed for millennia on the Mediterranean coasts. It is worth noting that most MPAs and OECMs so far designated are in coastal and shallow areas, which means these designations have triggered new interactions between protected areas and SSF.

# 2.1. SSF AND MPAS: A LONG HISTORY OF WORKING TOGETHER IN THE MEDITERRANEAN

Most MPAs are primarily designated with conservation objectives, but they may additionally aim to protect or recover fishery resource species and/or habitats. Fully or highly protected MPAs are likely to bring ecological benefits including an increase in abundance, biomass, density and fecundity of fish populations. This so-called 'reserve effect' is illustrated in Figure 6.

#### AVERAGE % CHANGE

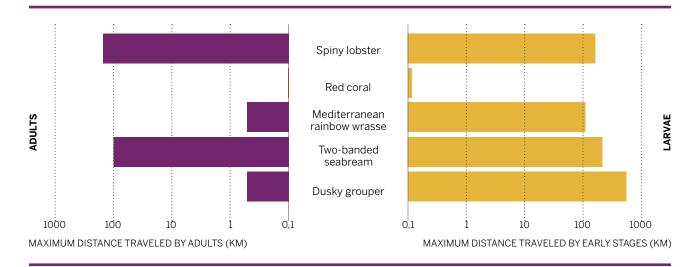


**FIGURE 6.** Fish biomass and density changes within fully protected areas (blue bars) and partially protected areas (red bars) compared to control fished locations outside MPAs in the Mediterranean Sea. (SOURCE: THE SCIENCE OF MARINE RESERVES PROJECT<sup>4</sup> (PISCO) AND THE UNIVERSITY OF NICE-SOPHIA ANTIPOLISGIAKOUMI, 2017).

<sup>&</sup>lt;sup>4</sup>For more information refer to http://www.piscoweb.org/science-marine-reserves

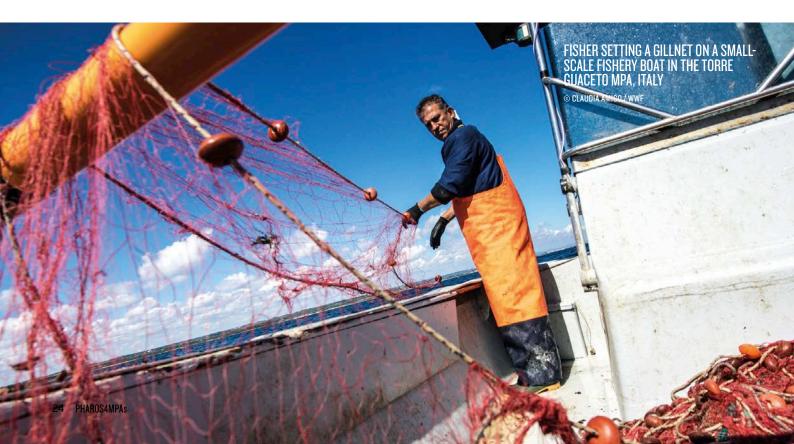
Another benefit is that eggs, larvae, juveniles and adults pass across MPA borders, as illustrated in Figure 7. For adult fish this is known as the 'spillover effect', and it may lead to economic benefits for SSF in adjacent areas [12].

The establishment of MPAs in the Mediterranean is a relatively recent development for SSF. While MPAs and other spatial tools such as Fisheries Restricted Areas (FRAs) can support an ecosystem approach to fisheries management, the designation of coastal MPAs has created new constraints for fishers. This has led to frequent conflicts and has in some cases made it difficult to promote collaboration between MPAs and small-scale fishers.



**FIGURE 7.** The maximum distance that some adults marine animals travel ('spillover') from MPAs in the Mediterranean Sea and on the left and the estimated distance at which eggs and larvae of marine animals that live in the Mediterranea can be exported on the right. (SOURCE: THE SCIENCE OF MARINE RESERVES PROJECT<sup>5</sup> (PISCO) AND THE UNIVERSITY OF NICE-SOPHIA ANTIPOLIS)

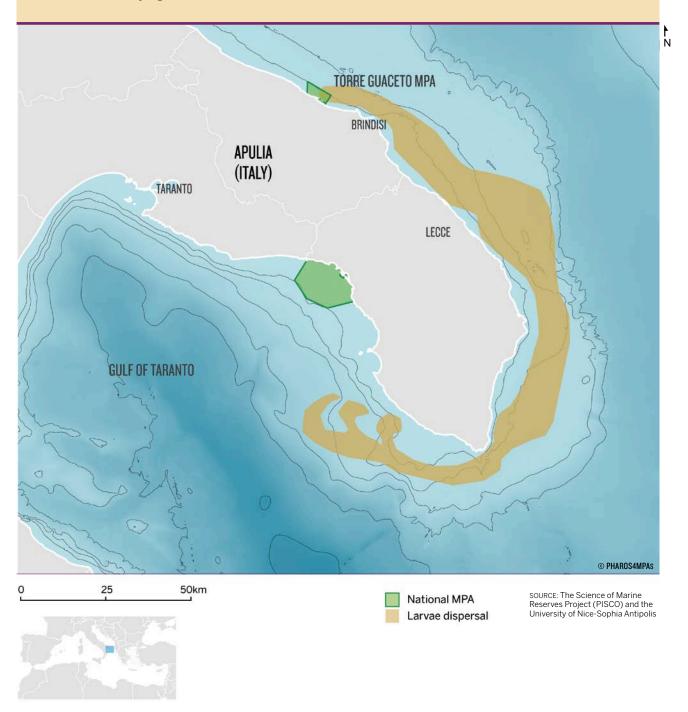
<sup>&</sup>lt;sup>5</sup> For more information refer to http://www.piscoweb.org/science-marine-reserves



#### TORRE GUACETO MPA, ITALY

Fully protected areas can support fish populations outside MPAs when eggs and larvae drift beyond MPA borders. For example, scientists studying the Torre Guaceto

MPA found that the high number of large seabreams that inhabit the MPA produce enough eggs and larvae to replenish both the MPA and areas outside it – as figure 8 shows, the benefits are felt more than 100km beyond the MPA boundaries [17].



**FIGURE 8.** Biological tracking shows that seabream eggs and larvae disperse far beyond the Torre Guaceto fully protected area into fished areas

However, the situation is evolving. Increasing numbers of MPA managers and small-scale fishers are finding that through dialogue they can create a shared vision and objectives, such as the recovery of fish resources. According to the analysis made in 2014 by Di Franco et al., there are "developed" interactions between SSF and MPA management bodies in 47% of Mediterraean MPAs (12 out of 26 analyzed) - these interactions generally take the form of meetings where fishermen act as key stakeholders and communication is bidirectional.

Today, there are many positive case studies of SSF operating sustainably in Mediterranean MPAs [14, 15, 16].

In 2012, a meeting of the MedPAN network in Carovigno [18]. Italy, brought together 23 small-scale fishers and 24 MPA managers from six countries – Croatia, France, Spain, Italy, Greece and Slovenia. A statement released after the event emphasised that "the MedPAN network supports MPA artisan fishermen and considers that MPA artisan fisheries can be sustainable". This vision is now widely shared across the Mediterranean [19] and reflects the region's unique approach to its large SSF community, particularly in the context of EU fisheries.

# 2.2. INTERACTIONS RFTWFFN SSF AND OTHER ACTIVITIES IN MPAS

In general terms, the constant growth of marine activities in the Mediterranean – from coastal tourism to aquaculture, shipping, oil and gas extraction, marine mining and new sectors such as offshore windfarms - is leading to increasing conflicts of interest in professional fishing grounds. In parallel, land-based pollution sources such as agricultural runoff or industrial releases are having a significant impact on fish stock sustainability [20].

In terms of access to fisheries resources themselves, Mediterranean MPAs see frequent conflicts between professional small-scale fishers and recreational fishers. These are made worse by the different legal contexts of the two forms of fishing (recreational fishing has still not been defined at European level), along with a lack of recreational fisher data and management regimes. While more detailed assessments are needed, several scientific studies have shown that recreational catches can in some areas be similar to, and even exceed, catches by professional SSF fleets [21, 22, 5, 12]. This may not be a general pattern, but such studies make it clear that the impact of recreational fishing on fish resources should not be neglected. In addition, some recreational fishers sell their catch illegally to local restaurants, unbalancing markets and increasing competition for legitimate professional fishers.



**KEY FACTS** 

No-go, no-take or no-fishing zones covered 0.04% of the Mediterranean Sea (976 km²) in 2016

Fully or highly protected MPAs lead to an increase in abundance, biomass, density and fecundity of fish

The exportation of eggs, larvae, juveniles and adults across MPA borders may generate economic benefits for SSF in adjacent areas

SSF face increasing interactions with other maritime sectors



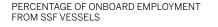


# 3.1. SOCIO-ECONOMIC BENEFITS AND IMPACTS

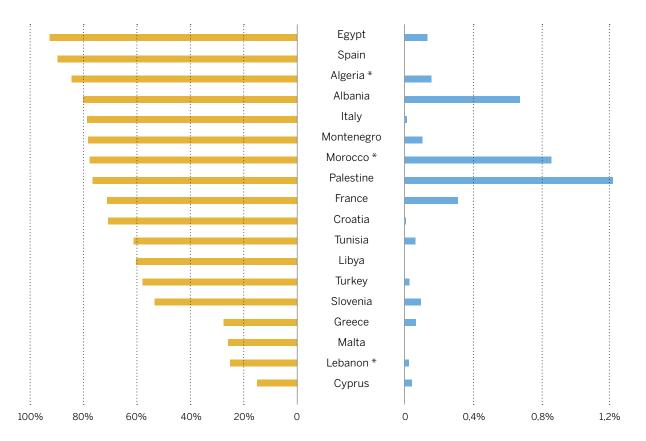
Fish contribute a significant amount of animal protein to the diets of people worldwide. SSF support livelihoods in coastal communities and contribute significantly to food security, especially in developing

countries. The same is true in the Mediterranean basin, especially in countries with high numbers of small-scale fishers. Despite accounting for only 26% of overall fishery revenue, SSF account for around 59% of all onboard employment in the Mediterranean, a total of some 134,300 jobs.

Despite the fact that the volume of catches and economic importance of SSF are relatively low compared to large-scale commercial fisheries, small-scale fishing in the Mediterranean is socially important and plays a significant role in coastal zones [23]. It is often also a key part of local culture and identity.



PERCENTAGE OF ONBOARD FISHERY EMPLOYMENT OUT OF THE TOTAL WORKING POPULATION



**FIGURE 9.** Total employment on fishing vessels as a percentage of the total working population on the right, and total percentage of onboard employment from SSF on the left.

<sup>\*</sup> Indicates no data available. (SOURCE: GFCM Mediterranean Contracting Parties' figures. SoMFi 2016, SoMFi, 2018)

### 3.2. ENVIRONMENTAL IMPACTS

While SSF have the potential to impact fishing resources and marine ecosystems, they are generally considered to have less ecological impact than industrial fisheries, and are usually seen as more sustainable [24,25]. Some areas dominated historically by SSF – such as the Greek Ionian Sea – show general good marine ecosystem conditions [26].

#### **IMPACT ON FISH STOCKS**

While other factors including climate change, pollution from marine and terrestrial sources and catches from recreational fishers also contribute to the decline of fish resources, SSF still have the potential to cause serious impacts when for example the fishing effort is very high [27,28,29].

SSF can have a significant impact on specific species (mostly carnivores) depending on the fishing gear used and fishing grounds accessed. SSF may have considerable adverse effects, such as altering biodiversity and changing ecosystem functioning by removing key species (e.g. top predators) or specific size classes [30]. Key species are regulative species which help control the proliferation of other species, such as sea urchins. When sea urchin populations become too big they may have an impact on the health of the algae communities on which they feed [31].

Most of the target species of SSF are classed as vulnerable on the IUCN Red List. In a study carried out in France, Italy and Spain, nearly 50% of the total SSF catch in coastal waters – and 100% in offshore waters – targeted vulnerable species [29].





Size-selective small-scale fishing affects hermaphrodite fish species, such as dusky grouper (Epinephelus marginatus), which can make up a significant portion of the catch. Fishing may disproportionately remove members of one or other sex, altering sex ratios and leading to egg or sperm limitation. Compounding the issue, a number of the coastal species caught display complex mating behaviours that include nest-building strategies, another stage in the breeding cycle where disruption due to harvesting can inadvertently accelerate rates of population decline. What's more, larger females have more offspring, reproduce over a longer period and spawn more eggs and larvae with better survival rates than smaller females, so their selective removal by SSF can further affect a stock's reproductive potential [27]

Additional impacts from SSF in the Mediterranean relate to catches below the minimum landing size, which prevent individuals from reaching maturity and reproducing [32, 33]. There is growing concern that levels of fishing mortality as a result of bycatch and discards threaten the long-term sustainability of many fisheries and the maintenance of biodiversity in many areas [34]. Little information is currently

available on total bycatch and discards for SSF, and this information differs among gear and areas. However, according to the GFCM, SSF have a low discard rate compared to most other fisheries (bottom trawl, beam trawl, longline and dredge fisheries) in the Mediterranean Sea. The available data suggests a discard ratio below 15% for the types of SSF gear assessed [1].

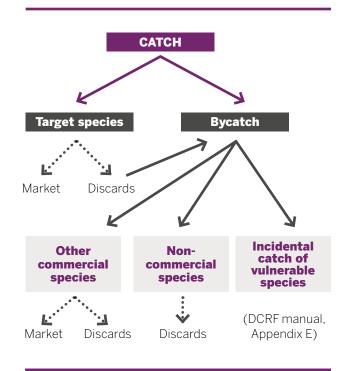
In the EU, a discard ban – or Landing Obligation - came into force on 1 January 2019 under the Common Fishery Policy reform of 2013 (EU 1380/2013). Under this regulation, certain catches of fish (species under TACs, or under minimum conservation reference sizes) are no longer allowed to be discarded at sea in any commercial fisheries. The MINOUW project has already identified solutions to reduce discards and impact on non-target species in SSF<sup>6</sup>. Some stakeholders fear, however, that this new policy might increase the illegal sale of fish below the minimum conservation reference size (MCRS) on informal markets, and reduce the focus on efficiency and sustainability [35, 36].

<sup>6</sup> http://minouw-project.eu/

#### IMPACTS ON ENDANGERED, THREATENED OR PROTECTED **SPECIES**

Many marine species are vulnerable in the Mediterranean Sea. They include birds, cetaceans, sharks and rays, sea turtles, and some fish species. A study carried out in France, Italy and Spain showed that among the species caught as bycatch by SSF, there was a total of 27 vulnerable vertebrate species [29].

Different fishing techniques can impact vulnerable species, as illustrated in Table 1.



**FIGURE 10.** Different components of the catch as defined by the GFCM Data Collection Framework (2018)

		WESTERN Mediterranean sea	CENTRAL Mediterranean sea	ADRIATIC SEA	EASTERN Mediterranean sea
-	Elasmobranchs				
	Polyvalent	4,2			1,2
	Longliners	95,8	100		98,7
	Marine mammals				
	Polyvalent	90,6	60		
	Longliners	7,6			
*	Sea turtles				
	Polyvalent	3,3	0,3	23,3	2,7
	Longliners	96,7	99,7	0,8	35,9
7	Seabirds				
	Polyvalent		0,5		
	Longliners	100	99,5		

TABLE I. Relative impact by vessel group (in percentage) on different groups of vulnerable species in the GFCM subregions. The polyvalent vessels and longliners include vessels of more than 12m LOA (SOURCE: SoMFi 2018)



#### Marine mammals are mostly impacted by polyvalent vessels when they're caught in nets.

Driftnets are still used in some fisheries, and these may indiscriminately catch marine mammals and other vulnerable species. In some areas marine mammals take fish from the nets, and are killed or harassed as a result. Understandably though, fishers point out that marine mammals often damage fishing gear and are competing for the same limited and declining fish resources.

Small vessels using set nets, demersal longlines or pelagic longlines make up most of the Mediterranean fleet, and likely cause more incidental or intentional deaths of **marine turtles** than large vessels typically using bottom trawls or pelagic longlines. The total annual bycatch of marine turtles in the Mediterranean is estimated at up to 132,000 individuals, resulting in a potential annual mortality of 44,000 [37].

Gillnet, trammel net, longline and bottom trawl fisheries are considered a major threat to the survival of **shark and ray populations** in the Mediterranean and the Black Sea [38].

**Seabird populations** are mainly impacted by longliners, while fishing on longliners' baits. <sup>7</sup>



#### DAMAGE TO SENSITIVE HABITATS

SSF around Europe's Mediterranean coasts have been shown to have an impact on vulnerable habitats including seagrass meadows (*Posidonia oceanica*), coralligenous reef assemblages and deep rocky habitats that contain sessile and fragile organisms such as gorgonians, sponges and corals, and that constitute an essential habitat for many exploited fish [39]. These negative impacts are caused by specific fishing techniques (e.g. small-scale dredges) and anchoring.

Lost or abandoned fishing gear – such as nets, hooks and lines – also causes harm. So-called ghost gear continues to catch fish, and gear of all kinds can abrade sessile animals like corals and gorgonians [40].

<sup>&</sup>lt;sup>7</sup> Project MINOUW, European Commission, creating a positive change in the sea, Retrieved June 06, 2019, from http://minouw-project. eu/wp-content/uploads/2018/07/D3-1-Effects-of-discards-ban-onseabirds.pdf



In addition, like any other garbage, lost or abandoned fishing gear pollutes habitats and its microplastics can enter organisms. As pointed out by the European Commission, fishing gear accounts for 27% of all beach litter – around 20% of all gear is eventually lost at sea.8 Garbage is also thrown away by fishers in some areas. Elsewhere though, fishers actively contribute to garbage collection at sea (for example through the Reseacyclons' Project9).

# GAS EMISSIONS AND CHEMICAL POLLUTION

In relative terms SSF have lower gas emissions than industrial operations. Studies of fuel consumption patterns by gear type report that typical SSF passive fishing gears such as pots, traps, long-lines and gillnets generally require lower amounts of fuel (approximately 0.1-0.4 litre per kg of catch) than active fishing gears such as bottom trawls (0.5-1.5 L/kg)<sup>[41,42]</sup>.

Oil pollution does occur in SSF, although at a lower rate compared to other maritime sectors. The total annual fuel oil consumption in SSF is much lower than in large-scale fisheries [43].

All SSF vessels use antifouling paints, and these diffuse chemical particles in the marine environment. There are no controls over how these paints are applied, so cumulative contamination can be considerable.

### **KEY FACTS**

SSF support direct employment and associated livelihoods in coastal communities

SSF contribute significantly to food security

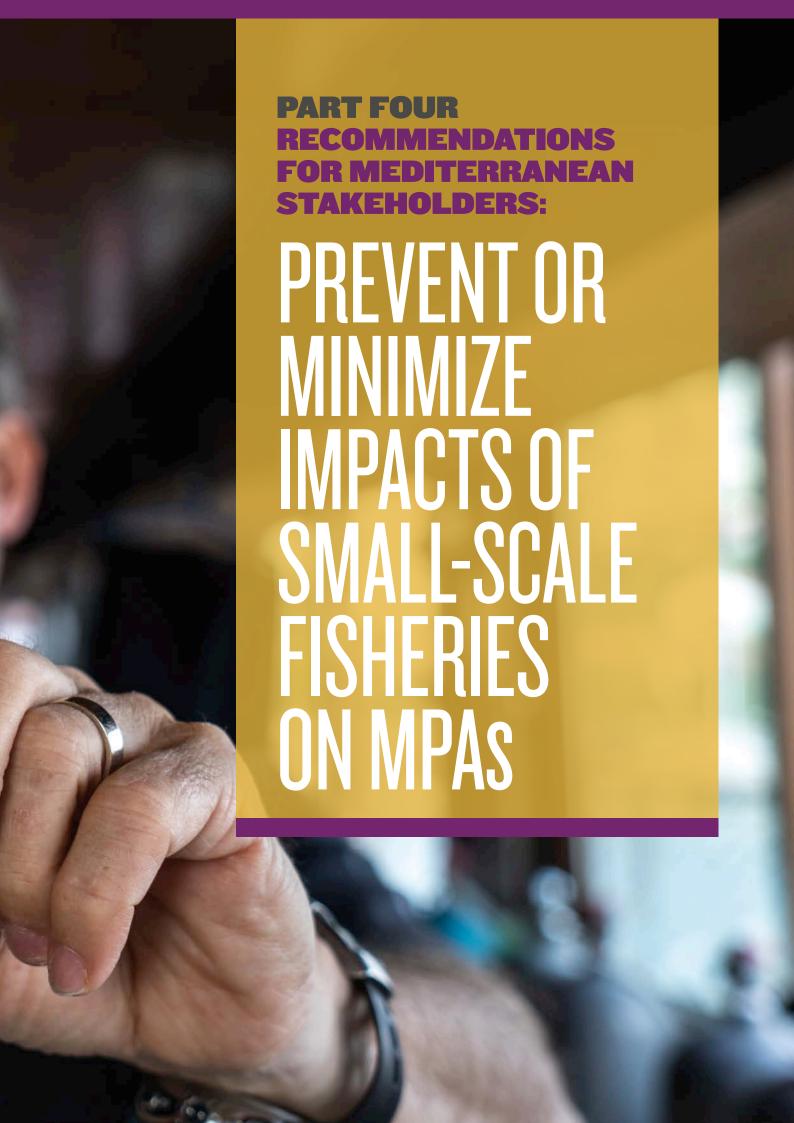
The marine environment and resources they rely on show an ongoing degradation

SSF are generally considered to have less ecological impact than industrial fisheries, and are usually seen as more sustainable. But they still can have significant impacts of their own, and these need to be addressed.

European Commission (2018). New proposal will tackle marine litter and "ghost fishing". Retrieved March 20, 2018, from https:// ec.europa.eu/fisheries/new-proposal-will-tackle-marine-litter-and-%E2%80%9Cghost-fishing%E2%80%9D\_ro

<sup>&</sup>lt;sup>9</sup> Project Reseaclons, SeaAquarium, pêcheurs et territoire engagés pour mer propre, Retrieved May 17, 2019, from https://www.seaquarium.fr/ app/uploads/2019/03/LIVRE-RESEACLONS-compress%C3%A9.pdf





This section gives an overview of recommendations for dealing with interactions between MPAs and SSF in the Mediterranean Sea.

Three different groups of stakeholders are included:

- Public authorities
- MPA managers
- Small-scale fishers

## 4.1. **PUBLIC AUTHORITIES**

Small-scale fishers have historically lacked effective representation at EU level, Mediterranean level and at Member State level. For many years they have asked to be recognised in public policies which take into account their regional specificities, experience, knowledge and contribution to the cultural heritage of local communities.

At the Mediterranean level, the implementation of the GFCM's Regional Plan of Action on SSF (RPOA-SSF) by 2028 is critical for the small-scale **fisher community.** Contracting parties must address its priority actions as soon as possible, incorporating them into national strategies and plans.



### KEY OBJECTIVES AND ACTIONS OF THE REGIONAL PLAN OF ACTION ON SSF INCLUDE:

- Recognize the status of the small-scale fisheries in the Mediterranean and the Black Sea, taking into account their regional specificities, experience, knowledge and contribution to the cultural heritage of local communities
- Recognize the socio-economic specificities of small-scale fisheries, such as the seasonality of their activities and the variability of their income
- · Support livelihoods for coastal communities, especially in remote/rural areas, through sustainable small-scale fisheries
- Ensure fishers are aware and accountable for the need to reconcile economic and social objectives with environmental objectives
- · When relevant, encourage the creation of bodies/associations to better structure, organize and represent the sector in a specific way in all decision-making processes. Strengthen and recognize the existing small-scale fisher organizations and platforms, including the associations of women, as stakeholders to be taken into account
- Improve the capacity to collect relevant data on small-scale fisheries and benefit from the traditional knowledge of small-scale fishers on the marine environment
- Provide equitable access to fishery resources for small-scale fishers by taking into account the socio-economic and cultural role of their activity in local communities
- Facilitate direct access to markets and public services for small-scale fisheries communities, and take action to promote and valorize local and fresh fish
- Give adequate attention and financial support to small-scale fisheries without unduly favouring large-scale operators
- Ensure proper establishment of monitoring, control and surveillance systems appropriate for small-scale fisheries
- Promote access to and use of new technologies within small-scale fisheries, with a view to improving safety, as well as monitoring, control and surveillance
- Promote fishing practices that minimize bycatch and impacts on the marine environment;

- Prevent any practice that would contribute to an underground economy and illegal, unreported and unregulated (IUU) fishing activities
- Avoid any policies that may contribute to overcapacity or may negatively affect smallscale fishing communities
- Reinforce the valorization of the sector, notably for locally caught fish, in order to maximize the economic benefits of small-scale fisheries
- Support the diversification of activities to ensure the sustainable development of the sector and coastal communities
- · Promote the diversification of catches and promote quality over quantity so as to provide an advantage to small-scale fisheries with benefits for consumers, fishers and the environment
- Promote the improvement of the qualification levels and skills of fishers
- Ensure that the establishment of MPAs is carried out in a participatory manner, taking into consideration the reality of small-scale fisheries livelihoods
- Take due account of small-scale fisheries in marine spatial planning, including their interactions with other sectors, such as other commercial fishing sectors, recreational fishing, aquaculture, renewable marine energies, oil drilling, transport and tourism
- Encourage the visibility and participation of small-scale fisheries representatives in the national and local decision-making and advisory processes when addressing fishery and other relevant policies, such as environment, transport, tourism and infrastructure
- Promote decent work and working conditions throughout the entire value chain for small-scale fisheries
- Consider the particular role of women in the economy of small-scale fisheries and coastal communities
- Recognize and take into account the impact of natural and human-induced disasters and climate change on small-scale fisheries.

The EU is a contracting party to the GFCM, so EU policies should be coordinated with the RPOA-

SSF. New CFP regulations, such as the control regulations, should take SSF specificities into account and deliver an approach that they can practically and effectively implement without becoming overburdened.



### RECOMMENDATION FOR NATIONAL **PUBLIC AUTHORITIES**

National public authorities are the most influential actors in implementing and coordinating international policies nationally and locally, whether the RPOA-SSF or EU policies. They should in general support the implementation of favourable frameworks, such as the ecosystem-based approach [43]. Articles 9 and 10 of the CFP set the principles, objectives and content of multiannual plans (MAPs), the primary tool enabling CFP implementation at regional level. The ecosystem-based approach is one of the pillars of CFP policy, and specific conservation measures based on it are to be included for some of the stocks covered by an adopted MAP.

Article 11 of this same policy ensures that conservation measures adopted by each Member State for its national waters are aligned with measures adopted under EU environmental legislation, such as the Habitats Directive, the Birds Directive (marine Natura 2000 sites) and the Marine Strategy Framework Directive (MSFD).



One of the targets for achieving this goal is the sustainable management and protection of marine and coastal ecosystems by achieving Good Environmental Status (GES) and implementing different measures such as no-take zones and MPAs in Europe's sea basins.

Environmental measures need to be taken to:

- Avoid the excessive impact of SSF on marine resources and vulnerable marine species, through gear and size restrictions, fishing effort limitation, seasonal closures, etc.
- Improve the selectivity of fishing gear with regard to size and species
- Increase investments in fishing techniques that minimise or eliminate discards by reducing or avoiding unwanted catches of commercial and non-commercial stocks
- Support the exclusion of fishing activities in areas showing high probabilities of unwanted catches, including the establishment of zones for the recovery of fish stocks, in spawning sites and nursery areas for juveniles.
- Support in close coordination with fishers increased of coverage of no-take zones that help ecosystem and marine resource recovery

- Minimize the impact of fishing activity and gear on sensitive habitats such as Posidonia meadows and coralligenous assemblages
- Establish derelict fishing gear management schemes from collection to final treatment or recycling together with waste collection plans in landing sites

Following the EU Directive on maritime spatial planning (MSP) (DIRECTIVE 2014/89/EU), EU Member States are currently developing their marine spatial plans and associated visions and strategies, a process which should be finalized by 2021. Non-EU countries are also addressing MSP, although on a non-binding basis.

Those plans identify current human activities and the most effective way of managing them, considering land-sea interactions and establishing appropriate cross-border cooperation. SSF fishing grounds should be carefully considered in MSP processes, particularly in mapping. The MSP Directive also requires Member States to apply an ecosystem-based approach according to the MSFD and to contribute to the protection, preservation and restoration of the marine environment, as well as consulting stakeholders and the general public.

Any new economic development overlapping with or impacting fishing grounds should be thoroughly discussed with fishers. Unless this is taken seriously, fisheries in general and SSF in particular could be significantly impacted by the development of other sectors. Collaboration with MPAs might be beneficial to fishers as both pursue common objectives of restoring fish stocks and preserving habitats used by fishes at different life stages.

From a socio-economic perspective, measures could include:

• Developing a national legal framework enabling fishery co-management to support sustainable stocks.

### **CO-MANAGEMENT IN CATALONIA**

There has been a growing trend towards decentralized governance in fisheries management. Co-management systems are gaining in popularity, in particular in SSF [44]. In May 2018, the government of Catalonia adopted a decree on the governance model for commercial fisheries that sets multi-stakeholder co-management as the general approach to fisheries management in the region.

- Improving legal frameworks that enable the SSF sector to be organized as cooperatives, producer groups or organizations, micro-enterprises or other structures to help fishers better manage their activities, mutualize costs, add value, develop diversification schemes (such as pescatourism activities), and ensure direct or short circuit sales.
- Guaranteeing good and fair access to landing sites adequately equipped to facilitate SSF activities fully serviced docking areas, moorings, refrigerated warehousing, drinking water, ice machines, litter disposal and recycling (e.g for expandable polystyrene boxes, etc.).
- Taking into account recreational fishing activities in fishery management through multiannual plans.
- Raising awareness among consumers and local communities about SSF activities and their benefits, to improve the image of the SSF sector.
- Assessing the implications of invasive species for SSF marine resources and markets.

Many MPAs have already supported some of these objectives in their management plans: the implementation of national strategies should take into account experience gathered and existing best practice.

# 4.2. MPA MANAGERS

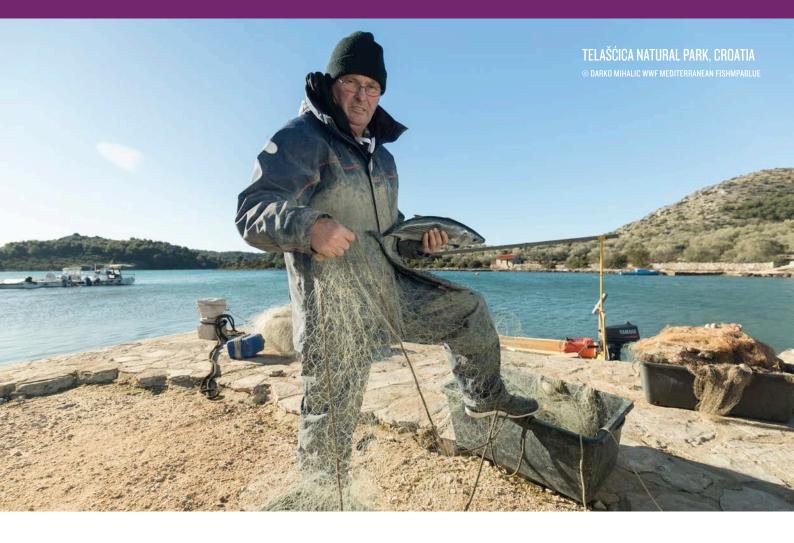
When the establishment of MPAs has been carried out in a participatory manner, taking into consideration the reality of SSF livelihoods, collaboration between the MPA management body and fisher communities can start in a favourable way.

Proposals to manage and regulate SSF in MPAs are usually made by management bodies in strong coordination with fisheries organisations and public authorities in charge of fisheries management. Proactively establishing a permanent and close dialogue with the SSF sector is crucial to implement management actions aimed at avoiding and minimizing the impact on target and non-target species and habitats, reducing conflicts with other sectors (e.g. recreational fisheries) and maximizing the economic benefits for professional fishers.

## SETTING UP PARTICIPATORY MANAGEMENT

A growing number of scientific publications show that a participatory approach to MPA management approach brings effectiveness and positive results. A recent systematic review [45] confirms that **co-management** can result in more solid management institutions as well as positive ecological and social outcomes: these include increased fish abundance and catches, the participation of different actors in resource management, and increased adaptive capacity for the fishery.

While co-management in its strictest sense is not always possible in MPAs governed by a management board, effective participatory management can still be achieved by establishing fisheries committees under the management board in which participants share decisions, responsibility and accountability. For example, the Calanques National Park (France) hosts a fisheries commission that includes representatives of both professional and recreational fisheries, MPA managers, scientific experts and NGOs. This commission discusses management measures that are submitted to the MPA management board for formal adoption and then turned into official legal regulation by the Maritime Prefect on the request of the management board.



The SSF Governance Toolkit produced by the FishMPABlue 2 project in 2019 aims to help MPA managers navigate the varied tools available to improve MPA effectiveness in SSF management, with a particular focus on increased stakeholder engagement and co-management. The long-term goal is to improve the overall governance of natural resource management in the Mediterranean<sup>10</sup>.



# 4.2.2 SOLID MONITORING

One of the most important and delicate issues in any management plan is the reliability of fishery data. Unfortunately, the SSF sector often lacks such data both inside and outside MPAs. Ideally, SSF monitoring in MPAs should be science-based while integrating the fishers' traditional ecological knowledge. The SSF monitoring protocol guide produced by the MedPAN network is a key resource in that respect [46].

The monitoring of fisheries data needs the collaboration of fishers. Key aspects of an SSF monitoring approach include:

- Adopting a systemic approach which considers fishing activities inside and outside the MPA.
- · Using comprehensive and reliable data for habitat mapping
- · Building a more detailed understanding of the SSF fishing fleet operating in and near the MPA. Data should not be limited to the number of fishing vessels but should also include fishing effort, fishing gear, number of fishers, target species, bycatch, landing value etc.

<sup>10</sup> Project FishMapBlue2, European Commission, Fishers and marine protected areas, a partnership for sustainability in the mediterranean, Retrieved 02 February, 2019, from https://fishmpablue-2.interreg-med.eu/

- Regular monitoring of fishing effort. Captures Per Unit Effort (CPUE) need to be measured in areas of different protection status to assess the effectiveness of the zoning.
- Monitoring SSF socio-economic parameters.

These data are critical to identify and assess the effectiveness of area-based management strategies (no-take zones in particular), and adapt management and regulations in response.

In the Egadi Islands, Italy, monitoring activity is funded through an agreement between the MPA management body and associations to which the local fishing cooperatives are registered, including a small fee that is paid to fishers.

The use of digital tools in SSF is in line with the aim to phase out paper-based monitoring and reporting in the EU Control Regulation. Several digital catch reporting tools for SSF have been developed in EU countries including Croatia, France, Spain and Greece.

### 4.2.3 DEVELOPING THE RIGHT ZONING APPROACH

The zoning of an MPA can be a key tool in the sustainable management of SSF. In some countries, the zoning of an MPA is fixed at its designation and the MPA manager can't then change it. In other countries, new zoning schemes can be implemented even after designation.

Zoning must take into account the results of previous monitoring studies, as well as other criteria:

- The surface of the MPA
- The cartography and the vulnerability of marine habitats
- The presence, protection status and vulnerability of the species inhabiting and/or using the area within their life-cycle
- Interactions with other sectors (e.g. recreational fisheries, scuba divers, leisure boating)

### THE ROLE OF NO-TAKE ZONES

No-take zones are spatial closures that prohibit all forms of resource extraction, including fishing. In the Mediterranean, 40% of national MPAs include one or more no-take zones, sometimes surrounded by 'buffer zones' where fishing is restricted compared with adjacent fished areas [10].

Permanent no-take zones are recognized as an effective management tool both for biodiversity conservation and for the regeneration of fish stocks (the spillover effect benefits SSF in adjacent zones) [47]. In the Mediterranean, some old, well enforced no-take zones give clear evidence of a reserve effect and the export of biomass (of adult fish) to surrounding areas [13].

The Côte Bleue Marine Park in France contains two notake zones (Cap-Couronne: 2.1 km² and Carry-le-Rouet: 0.85 km<sup>2</sup>) where all fishing is forbidden, as are dredging, anchoring and diving. In the rest of the park, all activities are authorized and subject to the general regulations at sea. Figure 11 shows the increase in fish mean size and landed biomass inside the reserves between 1995 and 2013, demonstrating the reserve effect.

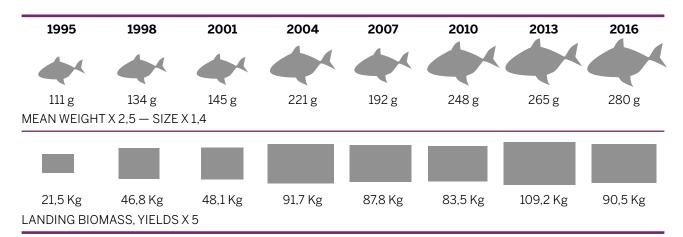
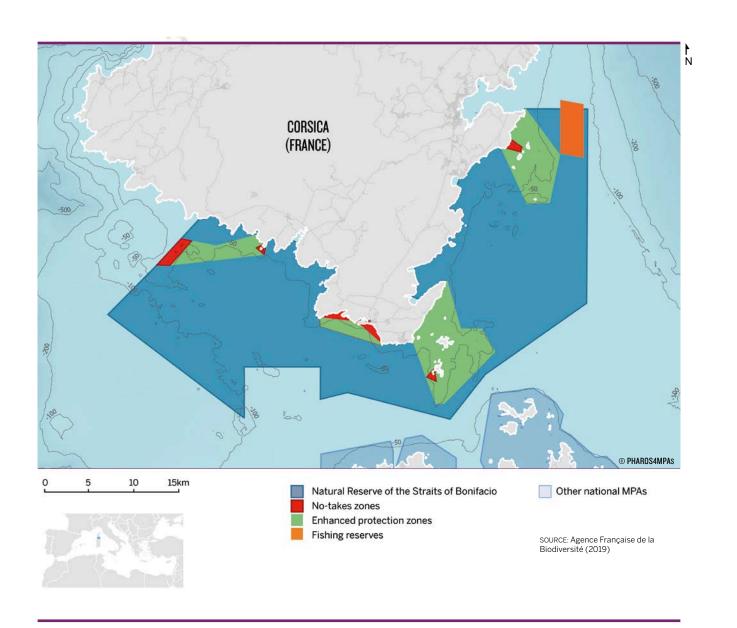


FIGURE II. Results from the long-term monitoring of fish assemblage carried out with experimental fishing (4x500 m trammel net) at Cap-Couronne reserve in the Côte Bleue Marine Park, France (SOURCE: CÔTE BLEUE MARINE PARK)



**FIGURE 12.** Map of the Natural Reserve of the Straits of Bonifacio, France, showing the different protection zones

# SOLUTIONS TO CONFLICTS OVER ACCESS TO MARINE RESOURCES

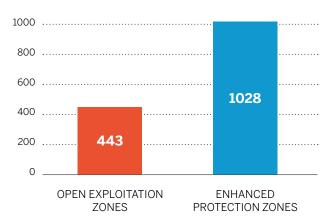
Zoning approaches should aim to avoid gear interaction or conflicts over access to marine resources, both with other fishers (e.g. large-scale industrial fishers, recreational fishers) and with other stakeholders. This spatial zoning should not only mitigate conflicts between individual users and different sectors but also contribute to diversifying captures - different gears in different zones can target different species of fish.

### The Natural Reserve of the Straits of Bonifacio

(France) provides an example of this approach, where enhanced protection zones have been established for small-scale fishers close to no-take zones. In these zones spearfishing is forbidden and recreational fishing is limited to hand-held gear, while SSF are authorized under the same conditions as in the open exploitation areas (Figure 12).

As a result of this zoning small scale fishers' Catch Per Unit Effort (CPUE) has increased: it's more than 2.3 times higher than in the MPA's open exploitation zone where all types of recreational fisheries are allowed.





**FIGURE 13.** Comparison of CPUE mean value (in g/patch of 50m of net/day) between open exploitation zones and enhanced protection zones of the Natural Reserve of the Straits of Bonifacio in 2018 (SOURCE: modified from Office de l'Environnement de la Corse. 2018)

### 4.2.4 FISHERIES MANAGEMENT PLANNING

Each MPA should have its own fisheries management plan encompassing:

- 1. A description of the fishery, especially its current status and any established user rights
- 2. The management objectives
- 3. How these objectives are to be achieved
- 4. How the plan is to be reviewed and/or appealed; and the consultation process for review and appeal.

The management plan should be prepared through co-management schemes and also involve other relevant stakeholders, the public, local authorities and government agencies. The planning process will address the issues and concerns of interested parties within the context of the stated purpose and objectives for the MPA. A good level of participation and positive incentives will enhance compliance and support for the MPA and minimize enforcement effort. Management decisions must be covered by enforceable regulatory provisions. The management plan should specify a budget and the sources of funding to support the implementation of measures.

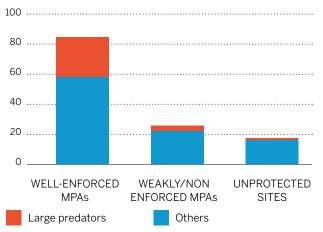
Specific management measures may include:

- Reducing fishing effort, through for instance seasonal or temporary closures in adjacent zones or through gear restrictions or time limitation of fishing (maximum 24 h)
- · Improving the selectivity of fishing gear
- Reducing incidental catch of elasmobranchs, seabirds, turtles and marine mammals through mitigation measures <sup>11</sup>
- Minimizing bycatch and reducing discards, through regulations or economic incentives
- Minimizing the impacts of SSF on vulnerable marine species through gear and size restrictions or seasonal restrictions
- Reducing ghost fishing catch by collecting lost fishing gear
- Implementing waste collection plans in landing sites.

# 4.2.5 CONTROLLING AND ENFORCING REGULATIONS

Effective control and enforcement of regulations are critical issues for the successful management of SSF in MPAs.





**FIGURE 14.** Biomass of large predatory fish (red bars) and other fish (blue bars) by protection levels. (SOURCE: THE SCIENCE OF MARINE RESERVES PROJECT (PISCO) AND THE UNIVERSITY OF NICE-SOPHIA ANTIPOLIS)

<sup>&</sup>lt;sup>11</sup> Examples of incidental catch mitigation measures: specific seasonal or temporary closures, additional gear restrictions, excluder devices and other technical solutions such as LED lights affixed to gillnets and set nets to simulate a barrier in the water <sup>[48]</sup>, and bird and mammal deterrent systems

A basic prerequisite for engaging fishers in MPA management is that the MPA can ensure an acceptable level of control of the territory. Fishers will expect the MPA to contribute effectively to the enforcement of the fishing area. The MPA must therefore have a specific strategy to address illegal fishing practices such as trawling in the coastal zone, poaching, illegal sale of catches etc.

Empowering MPA rangers with police capacity is not always allowed in Mediterranean countries, so collaboration between police authorities, administrations and local stakeholders (including SSF) should be enhanced. MPAs should advocate at national levels the need to empower MPA rangers with police capacity and to enhance coordination between legal bodies and instruments. The involvement of civil society in surveillance to fight illegal activities can also be an option, a system that for instance has already been implemented in Italy's Gaiola Underwater Park.

Surveillance effort should be optimized through land-sea control strategies and the use of cost-effective technologies. In Gyaros MPA, Greece, the guarding system utilizes new technologies such as a wide-range marine radar, a high definition infrared (IR) camera and a drone – this has resulted in a considerable reduction in illegal fishing<sup>12</sup>.

Overcoming conflicts of competences and inconsistencies between legal and institutional frameworks remains a challenging issue in many countries (e.g. how the conservation authority relates to the fisheries department). The set-up of supervisory, advisory or oversight bodies, coordinating commissions, cooperation protocols, joint policy statements and prearranged agreements between various government departments and other stakeholders, or specific MPA authorities, are needed to overcome these issues.

The case study of Calanques National Park in France is a good example of how a working group at local scale can help set up an effective coordination between all the actors concerned by control and surveillance.

The European network of environmental prosecutors promotes the enforcement of environmental criminal law by supporting the operational work of environmental prosecutors<sup>13</sup>. MPA managers can help raise awareness among prosecutors so they engage in addressing environmental crimes at sea by inviting them on field trips to the MPA.

<sup>13</sup> https://www.environmentalprosecutors.eu/



<sup>&</sup>lt;sup>12</sup> Project CYCLADES, programme LIFE, integrated management and sustainable development, Retrieved 11 November, 2018, from https:// cycladeslife.gr/en/



### FIGHTING POACHING IN CALANQUES MPA (FRANCE)

The Marseille public prosecutor's office has set up a body - the Calangues Operational Group (GOC) comprising the control authorities, the prosecutor's office, the managing team and guards of the Calanques National Park. The group meets twice a year, sets priorities and strategies for control, discusses ongoing legal procedures and draws up an annual report on the actions carried out.

Thanks to this collaboration, four men were convicted in 2018 over a major poaching operation<sup>14</sup> in the Calanques National Park. These poachers had illegally caught more than 24,000 sea urchins, many hundreds of kilograms of fish including protected and vulnerable species such as the dusky grouper (E. marginatus), and molluscs - with experts estimating total ecological losses at €166,000. The men were given suspended prison sentences of up to 18 months and were banned from the Calangues National Park. The Park also started a civil case in which the court will make the first decision ever over how much money in 'environmental damages' those found guilty must pay to a park in restitution.15

### 4.2.6 ENHANCING THE ADDED VALUE OF SMALL-SCALE FISHERIES **PRODUCTS**

In the Mediterranean, it can be challenging for SSF to access markets and remain profitable when they're forced to compete with industrial fisheries and aguaculture producers. MPAs can support the creation of small-scale fisher cooperatives, producer groups or organizations, promoting micro-enterprises and other structures to help small-scale fishers better organize their activities and potentially reduce costs, creating new added value for SSF catches.

The value of SSF landings can be enhanced by processes including:

### Optimization of distribution channels -

Connecting SSF with consumers may include several intermediate steps that reduce the profit fishers make from their landings. Schemes to promote more efficient product marketing or which facilitate direct sales to consumers should be encouraged through collaboration with small-scale fishers working in or near MPAs.

**Promotion of less marketable catches** – Pressure on main target species can be reduced by landing and promoting the use of other less well known species this may also contribute to the overall profitability of

<sup>&</sup>lt;sup>14</sup> MedPAN, poaching in the Calanques national Park: a historical trial in Marseille, Retrieved 26 June, 2019, from http://medpan.org/poachingin-the-calanques-national-park-a-historical-trial-in-marseille

<sup>15</sup> The Guardian, Pirates of the Med: the Mafia-style poachers threatening endangered fish, , Retrieved 26 June, 2019, from www.theguardian. com/world/2018/oct/13/pirates-of-mediterranean-divers-plunderendangered-fish-marseille-calanques-national-park



SSF. Fishers can link up with with local restaurants, or work to raise public awareness of lesser known species through culinary demonstrations, recipe books etc.

### **Ecolabeling of sustainable SSF products -**

Ecolabelling can increase the value of key species and/or improve the image of other under-appreciated alternative species. As an example, the Es Freus Marine Reserve in the Balearic Islands, Spain, supports the local fishers' PEIX SI certification: this guarantees labelled products come from local SSF, and ensures their traceability from boat to the plate. After a trial period, the certification procedure is now the preferred standard.

### Education and awareness-raising among

**consumers** – It's important that consumers are made aware of the environmental and social benefits of buying sustainable seafood products from small-scale fishing communities.

**Pescatourism** – Pescatourism can supplement the falling incomes of small-scale fishers and their families while providing an attractive activity for tourists

visiting the coast. For the fishers, pescatourism offers the possibility of increasing their income without increasing their fishing effort. Tourists who spend time with fishers will learn about the challenges and opportunities of life in today's marine sector, while also experiencing traditional local culture.

In 2019, WWF released a report [49] on how fully sustainable pescatourism can best function, including guiding principles, practical case studies, and recommendations for future development. MPAs in many Mediterranean countries – including Algeria, Croatia, France, Italy and Spain – already host pescatourism activities. In Croatia's Lastovo MPA, for example, fishers lay 300-400m of nets rather than the more usual 2km, leave them for a couple of hours while lunch is served on board, then pull the nets back in while the tourists watch<sup>16</sup>. National legal frameworks must now be developed across the Mediterranean to develop pescatourism.

<sup>&</sup>lt;sup>16</sup> Source: pers. comm. Mosor Prvan, WWF Adria

**KEY FACTS** 

Five different factors are likely to contribute to successful fishery governance in Mediterranean MPAs [23]:

- High levels of enforcement activity
- Active engagement of fishers in MPA management
  - Fisher representation on the MPA management board
    - A clear MPA management plan
- MPA involvement in the promotion of sustainable fishing (e.g. through labelling, awareness campaigns etc)



# 4.3. SMALL-SCALE FISHERS

The participation of fishers in MPA designation, planning and management through co-management or other processes is essential. For this to be successful, small-scale fishers need to come together to ensure their voices are heard within European, national, regional and local institutions.

Small-scale fishers have a responsibility to minimize the impacts of unsustainable fishing practices on their fishing grounds, particularly in MPAs. This requires several measures including taking steps to comply with minimum capture sizes, minimize bycatch and reduce discards.

For that purpose, reliable data on catches and fishing activities needs to be collected and shared, and collaboration with scientists and MPA managers on research and monitoring projects needs to be enhanced. Where necessary, confidentiality agreements should be used to protect the fishers' interests.

Illegal, unreported and unregulated (IUU) fishing in small-scale fishing grounds and the increasing competition for marine resources have a huge negative impact both on the fisheries and on the small-scale fishers themselves, whose activities have great social and economic significance. It's particularly important that small-scale fishers support national and local initiatives to tackle IUU fishing.

Small-scale fishers also have a role to play in collecting marine litter. They can contribute to the reduction of ghost fishing by collecting lost fishing gear, which can in turn be reused or recycled.

Small-scale fishers who operate in or near an MPA are stewards of the sea. They're often the first to spot developments that might be important for the MPA, and they can report them or take action in response. For example, small-scale fishers can:

- Raise the alert over incidental catches of species with high conservation value (marine mammals, sea turtles, birds etc) or catastrophic events like pollution or mass mortalities
- Detect the presence or the proliferation of alien and invasive species
- Report changes in the state of habitats and ecosystems
- Detect and monitor harmful situations caused by other economic sectors operating in the area.

# **ACRONYMS**

ALDFG Abandoned, Lost or otherwise Discarded Fishing Gear

CBD Convention on Biological Diversity

CFP EU Common Fishery Policy COFI FAO Committee on Fisheries

CPUE Catch Per Unit Effort

EAF Ecosystem Approach to Fisheries

EEZ Exclusive Economic Zone

EU European Union

FAO Food and Agriculture Organisation

**FMP** Fishery Management Plan **FRAs** Fisheries Restricted Areas

**GFCM** General Fisheries Commission for the Mediterranean

**GES** Good Environmental Status GOC Calanques Operational Group

**ICCAT** International Commission for the Conservation of Atlantic Tunas

International Union for Conservation of Nature **IUCN** IUU Illegal, unreported and unregulated fishing

LOA Length overall

MCS Monitoring, Control and Surveillance **MCRS** Minimum conservation reference size

MedPAN Mediterranean Marine Protected Areas network

MPA Marine Protected Area MSP Marine Spatial Planning

**MSFD** Marine Strategy Framework Directive NGO Non-governmental organization

NTA No-take Area NTZ No-take Zone

**OECMs** Other Effective Area-Based Conservation Measures **RFMO** Regional Fisheries Management Organization

**RPOA-SSF** Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea

SDG Sustainable Development Goals

**SPAMIs** Specially Protected Areas of Mediterranean Importance

SSF Small-Scale Fisheries

UN United Nations

TAC Total Allowable Catch

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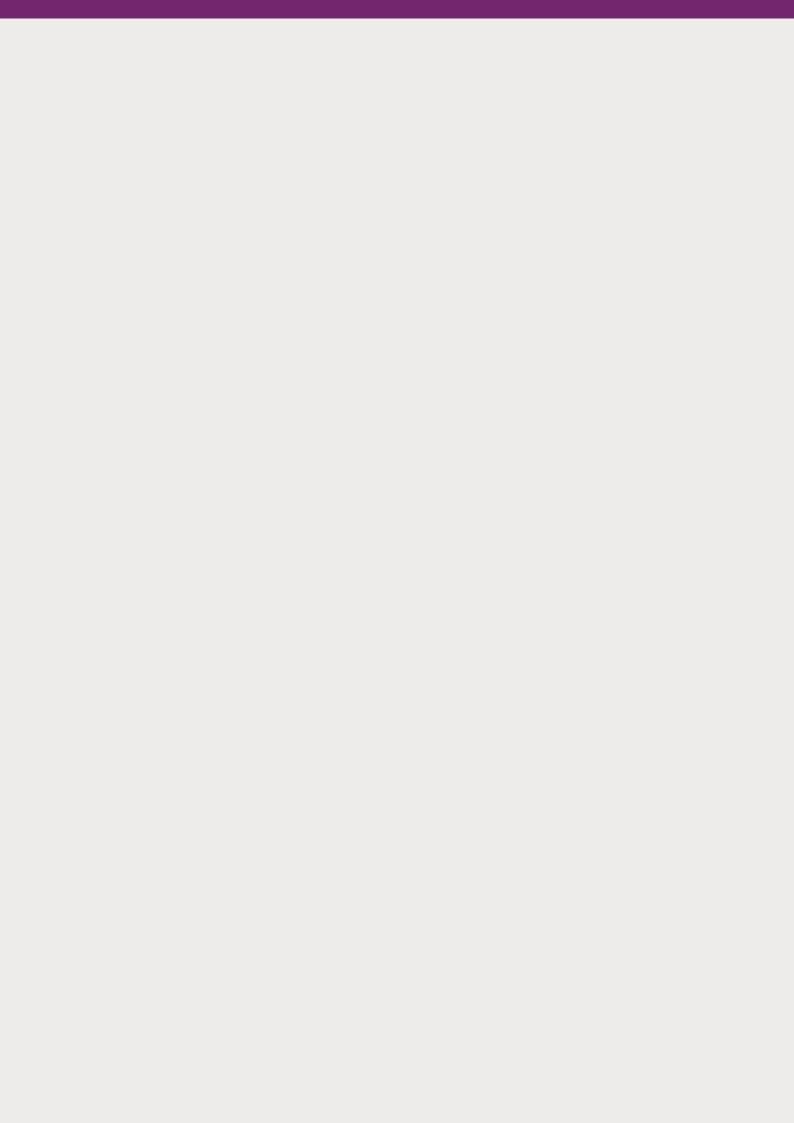
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# PROJECT IN NUMBERS

7.14.9⁄o of the Mediterranean Sea With €395 bn Gross Marine Product is under some form of protection, 1,231 MPAs (GMP) the Mediterranean Sea economy and OECMs covering 179,798 km<sup>2</sup>

is the **5th** largest in the region

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