

Sector Fiche: Fishing

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1 Basic Facts

Gross Value added	State of the sector	Presence across sea basins
<p>Nearly €3.9 and Gross Profit €1.6 billion (excluding subsidies).</p> <p>Generated by EU fishing fleet (excl. Greece) EU and Norway in 2016¹.</p>	<ul style="list-style-type: none"> Stable to decreasing. Overall deteriorated performance due to: <ul style="list-style-type: none"> - overfishing²⁻³⁻⁴. - stock fluctuations⁵. - differences in profitability between sea basins⁶. - low average first sale prices for many commercially important species⁷. 	<p>Dispersed throughout all sea basins⁸</p>

Land-sea interaction	Temporal aspect	Lifetime of installations
<p>Through ports and hinterland connections along the fisheries value chain (capture, auction, processing, distribution, wholesaler, retail, consumer)⁹.</p>	<p>Throughout the year and determined by fished species (e.g. in the North Sea: sandeel, whiting and sprat are the main target species¹⁰).</p>	<p>Approx. 1% of static gill nets are lost and become ALDFG with substantial adverse ecological and socio-economic effects¹¹.</p>

Interaction with other uses

The removal or discarding of marine species and the destruction of ecosystems by different types of gear is interfering with conservation interests¹²; future multiple-use approaches with aquaculture or off-shore windfarms¹³.

¹ European Commission (2016).

² European Commission (n.d.).

³ OurFish (2017).

⁴ STECF (2017).

⁵ HELCOM (n.d.).

⁶ STECF (2017).

⁷ Ibid.

⁸ Ibid.

⁹ De Silva, D.A.M. (2011).

¹⁰ ICES (2017).

¹¹ FAO (2016).

¹² The German Federal Agency for Nature Conservation (n.d.).

¹³ Stobberup et al. (2017).

2 Composition of the fishing sector

During the fisheries value chain, activities relevant for maritime spatial planning are related to fishing and capture. Recreational fisheries are also linked to the last step of the chain, consumption, as the tourists are paying for the sea tour as well. The activities of the fishing sector can be differentiated into a) the scale of fishing operation b) the type of fishing activity using different types of gear¹⁴⁻¹⁵.

By scale of fishing operation	Small-scale coastal fleet (SSCF) ¹⁶		In 2016, there were around 84,420 vessels as EU fishing fleet of which 74% were active. Out of these active vessels, almost 74% were small-scale, 25% large-scale (and less than 1% were distant water vessels active in waters outside EU) ¹⁷ .
	Large-scale fleet (LSF)		
	Distant-water fleet (DWF)		
By type of fishing activity	Industrial fishing (LSF) ¹⁸	Type of gear: large trawling nets and dredges; pelagic longlining and demersal longlining	Accounts for 80% of total catches handled in main EU ports (in 2015) ¹⁹ . There is some trend of improvement in the commercial / industrial fishing sector especially in the North Sea, Atlantic Sea and Baltic Sea, whilst the economic performance of certain EU fleets in the Mediterranean and Black Seas continues to stagnate ²⁰ . Positive economic outcomes remain especially for the large-scale (LSF) fisheries due to their greater efforts in achieving better fuel efficiency ²¹ .
	Artisanal fishing (SSCF)	Type of gear: gill and trammel nets, hook and line, nets	Small-scale fisheries, although slightly less profitable, continue to show signs of reduced performance with negative trends due to higher space conflicts with conservation measures (Habitats and Birds Directives requirements) as well as with other coastal marine uses (mainly aquaculture, marine aggregated extraction etc.) ²² .
	Recreational fishing	Type of gear: Hook and line, nets, grappling devices	As for recreational fishing, it constitutes a considerable social and economic activity at European level with a total expenditure believed to exceed 25 billion euros a year and the number of sea anglers is estimated to be 8-10 million in Europe ²³ .

Figure 1: Composition of the fishing sector

¹⁴ For details see STECF (2017).

¹⁵ Stobberup et al. (2017).

¹⁶ In Europe, the Regulation (UE) 508/2014 defines small-scale coastal fisheries as "fisheries carried out by fishing vessels of an overall length of less than 12 metres and not using towed fishing gear as listed in Table 3 of Annex I to the Commission Regulation (EC) 26/2004"

¹⁷ STECF (2017).

¹⁸ In this fiche both, artisanal and small-scale fisheries (family-based, low machining and small size), are called as "artisanal fisheries" as opposed to "industrial fisheries" (corporate companies and large-

size). Although there are exemptions where corporate companies operate small fishing vessels and family-based companies operate large fishing vessels, this approach might be the best way to explain differences, please see also http://www.arvi.org/publicaciones/IndustrialFleet_vs_ArtisanalFleet.pdf.

¹⁹ Eurostat (2017).

²⁰ STECF (2017).

²¹ Ibid.

²² Stobberup et al. (2017).

²³ Jobard et al. (2016).

3 Relationship between fishing and MSP

3.1 What are present spatial needs of the fishing sector?

Historically, fishing (along with shipping) is the sector whose spatial claim has the longest tradition for marine areas²⁴. Conflicts over access exist between existing or new marine uses.

Having a highly diversified sector (variety of gear types and specific sea uses, fishing species and types of vessels) could be positive for dealing with potential spatial barriers. However, such fragmentation makes fishers being a weaker party relative to other stakeholders, limiting their ability to influence the process in a MSP stakeholder exchange²⁵.

Growing MSP relevant data on fisheries, for example by using VMS data systems to control fishing activities, can help to get an overview of what happens in all EU sea basins for improved management²⁶.

The increased demand for fish and sea food proteins fosters the application of spatial sensitive decision support tools such as Marxan in order to secure sufficient space for fisheries²⁷.

To combat overexploitation of resources, the reduction of exploitation rates (e.g. by the reduction of the fishing fleet) to secure spawning grounds and migratory routes in particular for diadromous types of fish is foreseen²⁸. These links between threats and new management approaches for different stages of fish life cycles are relevant for MSP planners.

Fisheries is not only an economic sector according to areas with high fishing effort, high catches or high revenues. This approach ignores the broader view of maritime spatial planning which takes economic, social, cultural and ecological dimension of fisheries into account.

Fisheries have an important role in maintaining cultural seascapes which have a spatial aspect. Also other fishing activities currently not or not sufficiently regulated (recreational fisheries) could be included into MSPs.

3.2 Which anticipated future developments of the industry are relevant to MSP?

Technological innovation	Fleet reduction	Shifting use in coastal areas and Exclusive Economic Zones
Technological improvements and innovation allow the reduction of catch costs per unit, taking into account environmental legislation	The reduction of the number of fleets and the related possible positive effect on European fish stocks in a mid-term view may lead to higher GVA of the fisheries sector which can affect the prioritization of the sector positively within planning procedures and in relation to other sectors.	Further negative impacts of overfishing can cause a shift of uses in coastal areas and EEZs of Member States towards specific areas. This can affect common uses of EEZs by different countries as well.
Blue corridors	Extension of fisheries grounds	Multi-function ports
Focus on fish stock recovery under CFP will encourage MSP to put more attention to preservation of the connectivity of important fish habitats and to the preservation of the blue corridors. For the same reason MSP will face the challenge of taking into consideration large temporal and spatial variability of both the spawning and its effects while determining areas with special importance for reproduction of fish species ²⁹ .	The implementation of sustainable fisheries management and the accelerated use of selective fishing gear according to the CFP reform in 2014 may support the recovery of fish stocks and the extension of fisheries grounds to areas not in common so far.	Port infrastructure for fisheries can be influenced by reduced landings and marginalise specific ports and upgrade others, including the support of monopolies. Many ports should be turned into multi-function ports serving all shipping, sea tourism and fishing.

²⁴ Hassler et al. (2017).

²⁵ See DISPLACE model:

<http://www.msp-platform.eu/node/85>

²⁶ CFP

²⁷ Kannen et al. (2015).

²⁸ EU COM

²⁹ Zaucha et al. (2015).

Multi-use approach	Social-cultural aspects	Climate Change
<p>Multi-use approaches, e.g. with aquaculture, offshore windfarming or new marine uses can change the need for space of fisheries and influence fishers' behaviour and management of fish stocks. Synergies can be used to solve observing future trends in the uses of the seas. For example, an increase in MPA network may reduce the available area for fishing, while also supporting stock recovery (due to improvements in ecosystem health) and bringing back benefits to fishing due to increased fishing stocks and higher income. At the same time, fishers could provide services to aquaculture units, or could become fish farmers in their own rights³⁰.</p>	<p>Social-cultural aspects of artisanal fisheries could gain more attention through co-management with the touristic sector.</p>	<p>Climate change is expected to result in more extreme weather conditions (including heavier rain and storms)³¹ as well as warming waters rapidly and causing acidification. This may cause an alteration of fishery uses to other areas not used intensively so far.</p>

4 Interaction with other sectors

Shipping and ports	Tourism and recreation	Oil and gas
 <ul style="list-style-type: none"> Shipping lanes may cross fishing grounds; in case of sensitive nursery grounds this may be destructive³²⁻³³. Oil pollution from ships has negative impact on performance of the fishing sector³⁴. Ports are key for the value chain of fisheries³⁵. 	 <ul style="list-style-type: none"> Artisanal and recreational fisheries can attract tourism³⁶. 	 <ul style="list-style-type: none"> Negative interference with fishing activities might occur during prospection and exploitation phase in case of offshore oil accidents³⁷. During prospection phase, commercial fish species might be sensitive to sound and larval fish might even be killed by seismic sources³⁸.

Pipelines and cables	Fishing	Marine aquaculture
 <ul style="list-style-type: none"> Anchoring and bottom trawling forbidden in areas where cables and pipelines are not submerged. Potential electromagnetic effects on migrating species. Not sufficiently understood³⁹. 	 <ul style="list-style-type: none"> Recreational fisheries is a booming economic sector which can cause damage to ecosystems and in many cases competing for fish stock with commercial fishery⁴⁰. 	 <ul style="list-style-type: none"> Synergies as may provide common employment and service sector opportunities⁴¹. Eutrophication and pollution caused by animal aquaculture can change sensitive ecosystems for fish stocks⁴².

³⁰ Stelzenmüller et al. (2013).

³¹ Sarwar (2006).

³² The Hindu (2010).

³³ Simpson et al. (2010).

³⁴ De La Rue & Anderson (2009).

³⁵ Zaucha et al. (2015).

³⁶ Stobberup et al. (2017).

³⁷ Ibid.

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Strehlow et al. (2012).

⁴¹ Stelzenmüller et al. (2013).

⁴² Martinez-Porchas & Martinez-Cordova (2012).

Offshore wind and marine renewables	Marine aggregates	Conservation
		
<ul style="list-style-type: none"> • Potential environmental impacts for demersal fish stocks (but recovery is plausible⁴³): change in habitats⁴⁴; underwater noise⁴⁵; electromagnetic fields⁴⁶⁻⁴⁷. • Synergies through the introduction of hard substrate for fishing species depending on reef or gravel structures⁴⁸⁻⁴⁹⁻⁵⁰. 	<ul style="list-style-type: none"> • Extraction may alter the physical characteristics of sediments and the seabed⁵¹. • Long-term recovery after the exploitation can occur only where original sediment composition is being restored⁵². 	<ul style="list-style-type: none"> • Fisheries can benefit from MPAs and their recovering fish stocks⁵³. • Conflicts arise when using destructive fishing methods and gill nets in protected areas causing by-catch of non-target fish species, juvenile undersized target species, sea mammals and sea birds. Bottom trawling is physically disturbing the seabed and have destructing effects on the benthic community, the shift of community structures; lost nets can cause ghost fishing.

⁴³ WWF (2014).

⁴⁴ Krone et al. (2013).

⁴⁵ WWF (2012).

⁴⁶ Ibid.

⁴⁷ Petersen & Malm (2006).

⁴⁸ Zhang, M.H. (2015).

⁴⁹ Langhamer, O. (2012).

⁵⁰ Wilhelmsson, D., Malm, T., Öhman, C.M. (2006).

⁵¹ Stobberup et al. (2017).

⁵² Boyd et al. (2005).

⁵³ Stobberup et al. (2017).

5 Recommendations for MSP processes in support of the sector

<p>Tools, models and methods for fisheries management</p> <p>A range of these are available or under development⁵⁴ (despite some still not directly applicable by MSP managers). Models allow to analyse changes in species distribution, assess the effects of competing human activities, address socio-economic challenges and explore the potential benefits of MSP for fisheries. Research is starting to economically valorize sea space in relation to fishery and its implication for MSP⁵⁵.</p>	<p>Relevant life-stage areas for fishing and fish species</p> <p>MSP processes have to distinguish between relevant areas for fishing and for fish species according to life stages. Fish shows extensive variability in their behaviour, ecology, physiology and they vary in their abilities to detect and utilise sounds. Fish eggs and larvae should be separated for special consideration by planners because of their vulnerability, reduced mobility and small size⁵⁶.</p>	<p>Co-management</p> <p>Using synergies in terms of co-management, or spatially allocating areas within fishing grounds to reduce conflicts, and through the co-existence of fisheries with other existing or new marine uses⁵⁷.</p>
<p>Engaging and cooperating with fishermen</p> <p>Having an early and permanent engaging and cooperating environment with fishermen is essential in order to allow their participation in MSP processes⁵⁸. Planners should communicate with the sector via stakeholder engagement processes or via conversations within regional fisheries bodies like the General Fisheries Commission for the Mediterranean (GFCM) Secretariat or the BALTFISH FORUM⁵⁹ in the Baltic Sea.</p>	<p>Neighbouring states cooperation</p> <p>Neighbouring states should cooperate in order to take the needs of fish (and fisheries) into account as they move across national jurisdictions and live in shared ecosystems⁶⁰. The development of cross-border (pilot) MSPs could foster these processes⁶¹.</p>	<p>Fisheries integration in MSP</p> <p>MSP is not the only instrument for the spatial management of fisheries. As such, currently fisheries are usually not or not fully integrated into marine spatial plans. Those existing inshore or offshore maritime spatial plans taking into account the fisheries sector are not coming up with spatial designations but pass the issue to subsequent licensing procedures⁶² or focus on sectorial fisheries management⁶³. Reconsidering the global scale of fisheries will be important for a better integration of fisheries in MSP's in all EU sea basins.</p>

⁵⁴ See Section 6 "Initiatives" of this fiche for more information.

⁵⁵ Mytlewski, A. (2017).

⁵⁶ Popper et al. (2014).

⁵⁷ E.g. Stelzenmüller et al. (2013).

⁵⁸ Hassler et al. (2017).

⁵⁹ <http://helcom.fi/action-areas/fisheries/management/baltfish/>

⁶⁰ Gee et al. (2011).

⁶¹ Käppeler et al. (2011).

⁶² H. M. Government (2014).

⁶³ NME (2011).

6 Resources⁶⁴

6.1 Legal framework

Organisation	Title	Link	Short explanation
UN	UNFSA	http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm	Agreement for the Implementation for the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks
UNCLOS	United Nations Convention on the Law of the Sea	http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf	The United Nations Convention for the Law of the Sea became effective from 16th November 1982 and is the currently prevailing law of the sea. The convention is binding completely for the 160 member states. The IMO plays a vital role in the operation of UNCLOS. Part XI of UNCLOS deals with the aspect of the minerals found on the seabed on the EEZ. The International Seabed Authority was established on the basis of this part of the nautical law and called for equitable distribution of the proceeds of such seabeds.

⁶⁴ The information provided under this section is non-exhaustive. The intention is to provide the reader with basic information on the sector.

6.2 Actors

Name	Link	Short explanation
GFCM	http://www.gfcm.org/about/	General Fisheries Commission for the Mediterranean
HELCOM	http://www.helcom.fi/	BALTFISH
ICCAT	http://www.iccat.es/en/	International Commission for the Conservation of Atlantic Tunas
ICES	http://www.ices.dk/Pages/default.aspx	International Council for the Exploration of the Sea
Marine Management Organization (MMO)	https://www.gov.uk/government/organisations/marine-management-organisation	Provides services and information regarding maritime uses in the UK.
NASCO	http://www.nasco.int/	North Atlantic Salmon Organization
NEAFC	https://www.neafc.org/	North East Atlantic Fisheries Commission
OSPAR	https://www.ospar.org/	The Convention for the Protection of the Marine Environment of the North-East Atlantic
STECF	https://stecf.jrc.ec.europa.eu/	European Commission's Scientific Technical and Economic Committee for Fisheries

6.3 Initiatives

Name	Link	Short explanation
Adriplan Data Portal	http://www.northsearegion.eu/northsee	Fishery information and maps are included.
Baltic Sea data and map service	http://msp-platform.eu/practices/baltic-sea-data-and-map-services	Fishery information and maps provided by HELCOM.
BaltSeaPlan	http://msp-platform.eu/node/480	Produced a report "Towards integration of Fisheries into Maritime Spatial Planning", which suggests, amongst other things, that reservation areas may be established where special weight is given to fishing interests and only compatible uses are permitted.
European Maritime and Fisheries Fund (EMFF)	https://ec.europa.eu/fisheries/cfp/emff_en	Five European Structural and Investment Funds ¹ support the economic recovery of the EU until 2020. One of them, the European Maritime and Fisheries Fund (EMFF), is specifically tailored to Europe's seas and coasts. Its EUR 6.4 billion budget is focused not only on underpinning the new Common Fisheries Policy (CFP) and making fisheries and aquaculture more sustainable and profitable.
Marine Management Organisation's Management Information System	http://mis.marinemanagement.org.uk/	Shows the density of fishing vessels in different areas over time. This allows fishing information to be seen in conjunction with layers of information for other maritime activities and marine conditions.
Polish Study of Conditions of Spatial Development of Polish Sea Areas		Contains entire chapter devoted to fishery and during preparation of the Polish maritime spatial plan a special study was conducted devoted to detection of the places of the greatest importance for Polish artisanal fishery.
Portuguese MSP study (POEM)	http://msp-platform.eu/practices/plano-de-ordenamento-do-espaco-maritimo-poem	Involved the participation of representatives of the fishing industry and their concerns were incorporated into the study.

6.4 Selected literature

Author	Title	Link	Short explanation
Bergstrom, L., Korpinen, S., Bergstrom, U., Andersson, A.	Essential fish habitats and fish migration patterns in the Northern Baltic Sea. BALANCE Interim Report 29	http://balance-eu.org/xpdf/balance-interim-report-no-29.pdf	The report summarizes the current state of knowledge on essential fish habitats (EFH) and patterns of fish dispersal within a Baltic archipelago area. Additionally, a preliminary analysis is presented, where breeding and feeding areas of herring are described and discussed for connectivity and representativity with respect to the Finnish Natura 2000 network.
EUMOFA, 2017.	The EU fish market	www.eumofa.eu Retrieved 2017-12-06.	
ICES. 2016	CM 2016/SSGIEOM:10. 76 pp.	https://www.ices.dk/publications/our-publications/Pages/ICES-Advice.aspx	
Janßen, H., et al., 2017.	Integration of fisheries into marine spatial planning: Quo vadis? Estuarine, Coastal and Shelf Science	http://www.sciencedirect.com/science/article/pii/S0272771417300070	The relationship between fisheries and marine spatial planning (MSP) is still widely unsettled. While several scientific studies highlight the strong relation between fisheries and MSP, as well as ways in which fisheries could be included in MSP, the actual integration of fisheries into MSP often fails. In this article the state of the art and latest progress in research on various challenges in the integration of fisheries into MSP has been reviewed.
Lamp, J., 2014	Towards integration of Fisheries into Maritime Spatial Planning. BaltSeaPlan Report 26	http://www.baltseaplan.eu/index.php/Reports-and-Publications;809/1	The report provides an overview of results and solutions found within the BaltSeaPlan project on these various aspects and should therefore offer guidance, inspiration and recommendations for Maritime Spatial Planners on how to better deal with the important topic of fishery in MSP.
Meaden, G.J., Aguilar-Manjarrez, J., Corner, R.A., O'Hagan, A.M. & Cardia, F., 2016	Marine spatial planning for enhanced fisheries and aquaculture sustainability - its application in the Near East. FAO Fisheries and Aquaculture Technical Paper No. 604 Rome, FAO	https://www.researchgate.net/publication/311649850_Marine_spatial_planning_for_enhanced_fisheries_and_aquaculture_sustainability_its_application_in_the_Near_East	This document provides a clear and comprehensive account for the application of marine spatial planning (MSP) within the Regional Commission for Fisheries (RECOFI) region. It builds on regional technical workshops, held under the auspices of the Food and Agriculture Organization of the United Nations (FAO), aimed principally at improving the prospects for fisheries and aquaculture in the Near East.

7 List of acronyms

Acronym	Full title
ALDFG	Abandoned, lost or otherwise discarded fishing gear
BALTFISH	Baltic Sea Fisheries Forum
BSRAC	Baltic Sea Regional Advisory Council
CFP	Common Fisheries Policy
DWF	Distant-water fleet
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
GFCM	General Fisheries Commission for the Mediterranean
GVA	Gross Value Added
IBSFC	International Baltic Sea Fishery Commission
ICCAT	International Convention for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
IMO	International Maritime Organization
LSF	Large-scale fleet
MPAs	Marine Protected Areas
MSY	Maximum sustainable yield
NEAFC	North East Atlantic Fisheries Commission
RFMO	Regional fisheries management organisation
SSCF	Small-scale coastal fleet
TACs	Total Allowable Catches
UNFSA	Agreement for the Implementation for the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks
VMS	Vessel monitoring system

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