EUROPEAN
COMMISSION

Brussels, 18.9.2020
SWD(2020) 206 final

COMMISSION STAFF WORKING DOCUMENT

REGIONAL SEA BASIN ANALYSES
REGIONAL CHALLENGES IN ACHIEVING THE OBJECTIVES OF THE COMMON FISHERIES POLICY – A SEA BASIN PERSPECTIVE TO GUIDE EMFF PROGRAMMING

Contents

REGIONAL CHALLENGES IN ACHIEVING THE OBJECTIVES OF THE COMMON FISHERIES POLICY

A SEA BASIN PERSPECTIVE TO GUIDE EUROPEAN MARITIME AND FISHERIES FUND PROGRAMMING

INTRODUCTION

The reform of the Common Fisheries Policy (CFP) in 2013 introduced a new form of governance. As Union waters and fisheries are too widespread and diverse for one size fit all-solutions, the decision was taken to move from a top-down fisheries management approach to a more regionalised sea-basin approach. Regionalisation under the CFP brings decisions closer to those affected and provides a better basis for bringing in local experience, knowledge and expertise, while also allowing for better involvement of stakeholders in the decision-making process.

Under the principle of shared management of EU funds, Member States draft their European Maritime and Fisheries Fund (EMFF) programme in line with their own specific challenges and priorities, on the basis of their SWOT (strengths, weaknesses, opportunities and threats) analysis. As regionalised approaches to fisheries management decisions have become normal practice, the main funding instrument for the CFP should also contribute to addressing common sea basin challenges.

For the purpose of better targeting EU public support to the achievement of the objectives of the CFP, Article 9(5) of the Commission proposal for a Regulation on the EMFF[1] provides that:

'the Commission shall develop an analysis for each sea basin indicating the common strengths and weaknesses of the sea basin with regard to the achievement of the objectives of the CFP, as referred to in Article 2 of Regulation (EU) No 1380/2013'.

These analyses aim to support the EMFF programming process as additional background complementing the national SWOT analyses.

The European seafood sector – fisheries, aquaculture, processing – is very diverse and faces natural, geographic, economic and social situations which vary greatly from one sea basin to another and from one country or region to another within each sea basin. Nevertheless, while Member States will make their own respective programming choices, a number of trends and challenges are common to all in the same sea basin because they depend on the same natural resources and ecosystems.

This document aims to highlight how the EMFF can respond to these shared challenges via the Member States' national programmes. It also intends to draw Member States' attention to the need to take these shared challenges into account in building synergies at sea basin level. The analysis at sea basin level should be seen as an opportunity to identify specific regional challenges based on factual information and to focus on possible actions that fall within the scope of support the EMFF can provide.

[1] COM (2018) 390 (final).

The sea basin analyses are underpinned by robust evidence. The sources include the main documents published by the Commission, e.g. the Annual Economic Report, the Communication on Fishing Opportunities, the fleet capacity analysis, the Aquaculture Economic Report and the Blue Economy Report.

The main body of this document is composed of detailed regional chapters providing a specific assessment of the main strengths and challenges on the main CFP objectives. These elements are complemented by an 'EMFF toolbox' (Annex), which provides practical indications on possible actions under the broad scope of support of the EMFF. This toolbox is neither prescriptive nor exhaustive but gives indicative guidance to help Member States develop concrete actions to tackle specific sea basin challenges. Member States are encouraged to devise flexible support systems in their programmes. This would help move away from a large range of very specific small measures to more comprehensive frameworks of action that can be used flexibly in case of changing circumstances.

The sea basin analyses and the contribution of the EMFF should be seen in the wider context of the Commission's new political priorities. The Commission recently adopted the European Green Deal[2] that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy. The blue economy as a whole, and European fishermen in particular, have a role to play in this transition by tackling climate change, protecting the environment and preserving biodiversity. The Common Fisheries Policy and the European Maritime and Fisheries Fund will be key tools supporting these efforts while ensuring a decent living for fishermen and their families.

When Member States prepare their programmes, they should also draw on the recently adopted new Biodiversity Strategy[3] to bring nature back into our lives, and the Farm to Fork Strategy[4] for a fair, healthy and environmentally friendly food system. These two strategies are mutually reinforcing, bringing together nature, farmers, business and consumers to work jointly towards a competitively sustainable future. As an integral part of the European Green Deal, the strategies propose ambitious EU actions and commitments to halt biodiversity loss in Europe and worldwide. EU action seeks to transform our food systems into global standards for competitive sustainability, to protect human and planetary health and to protect the livelihoods of all actors in the food value chain.

The COVID-19 crisis has shown our vulnerability to sudden changes in the environment we live in and on which we depend. It has also revealed how crucial a well-functioning food system is for our society. The two strategies put the citizen at the centre, by committing to increasing the protection of land and sea, restoring degraded ecosystems and establishing the EU as a leader on the international stage both on the protection of biodiversity and on building a sustainable food chain.

Adopted during the COVID-19 pandemic, the Biodiversity Strategy is a central element of the EU's recovery plan, crucial to preventing and building resilience to future outbreaks and providing immediate business and investment opportunities for restoring the EU's economy. The strategy also aims to make the focus on biodiversity an integral part of the EU's overall economic growth strategy. It brings forward concrete steps to put Europe's biodiversity on the path to recovery by 2030, including transforming at least 30% of Europe's seas into effectively managed protected areas.

[2] COM (2019) 640 (final).
[3] COM (2020) 380 (final).
[4] COM (2020) 381 (final).

The Farm to Fork Strategy will enable the transition to a sustainable EU food system that safeguards food security and ensures access to healthy diets sourced from a healthy planet. It will reduce the environmental and climate footprint of the EU food system and strengthen its resilience, protecting citizens' health and ensuring the livelihoods of economic operators. The strategy sets concrete objectives and targets to transform the EU's food system, including a 50% reduction in sales of antimicrobials used for farmed animals and aquaculture, a significant increase in organic aquaculture and a well-targeted support for the algae industry. European fishers and aquaculture producers play a key role in the transition to a more equitable and sustainable food system.

The sea basin analyses should also be intended as a tool to focus the EMFF support on strengthening the EU's competitive position in the emerging blue bioeconomy, which includes all marine bio-based sectors. In this respect, the updated Bioeconomy Strategy[5] could serve as a basis to unlock the potential of bioeconomy approaches in coastal areas and islands, offering opportunities to rethink blue growth models and extract more value out of limited biological resources. By tapping into the renewable potential of marine organisms and ecosystems, the blue bioeconomy can contribute to improving food security and developing innovative products for a more sustainable lifestyle.

These challenges, which are relevant across the board, should be addressed together and in synergy with the more specific challenges of the CFP towards the sustainable management of fisheries and of fleets exploiting marine biological resources. In this respect, the following paragraphs present an overview of the main common CFP challenges for the EU. These will subsequently be dealt with specifically for each sea basin in the regional chapters of this document.

1 Reducing the impacts of fishing on ecosystems

1.1 Reducing fishing pressure

Progress in implementing the Common Fisheries Policy reform of 2013 has been steady over the past few years, and fishing pressure overall has been declining towards the sustainable levels set in CFP objectives based on maximum sustainable yield (MSY[6]). However, in some areas, much more still needs to be done to meet the objectives.

Many stocks remain overfished and/or outside safe biological limits. In the Northeast Atlantic, North and Baltic Seas, the status of stocks has significantly improved, with the share of overexploited stocks (i.e. F>F*msy*) having decreased from around 75% to close to 40% over the last 10 years. However, some serious situations persist for certain stocks, for example cod in the Baltic Sea. In contrast, the situation remains worrying in the Mediterranean and Black Seas, as a small number of stocks only is assessed scientifically and only 13% of them (6 stocks) are not overfished.

More efforts are needed to meet the objectives of the CFP. Doing so will require adaptation of fishing techniques, behaviours and investment strategies. In some cases, long-term structural changes in fishing communities will be necessary, and financial support may be needed to assist in the transition to new business models and to fishing with lower impact on the environment, while resulting in higher catches and revenues.

[5] COM (2018) 673 (final).
[6] State of Play of the Common Fisheries Policy and Consultation on the Fishing Opportunities for 2019. COM (2018) 452 (final).

1.2 Managing the landing obligation on board and on land

The obligation to land all catches has represented a fundamental shift in fisheries management by moving from managing landed catches to managing and landing all catches, including catches that used to be discarded. This shift requires intensive collaboration among stakeholders to address it as part of the regionalisation of the CFP. However, much remains to be done to fully implement the landing obligation, for a number of reasons: (i) the fishing industry still seems reluctant to embrace the change; (ii) there is a lack of accurate reporting of fish discarded under exemptions; (iii) Member States do not ensure effective control and enforcement of landing obligation requirements; and (iv) market outlets for catches below minimum conservation reference size are insufficient.

Overall, the steps taken by the Member States and producer organisations to promote compliance with the landing obligation diverge widely in approach. Some Member States make efforts to inform fishers, while some carry out specific studies and pilot projects to test selective gears and avoidance strategies, and others are strengthening efforts to support effective implementation of the landing obligation. The landing obligation is not only a challenge in terms of compliance (i.e. actually landing all catches), but also in terms of structural adaptation of fishing patterns to avoid unwanted catches in the first place, for example through better selectivity and optimised management of fishing opportunities.

1.3 Preserving ecosystems through environmental legislation

The CFP, as all other European policies, must incorporate environmental protection requirements with a view to promoting sustainable development. It must: (i) ensure that the negative impacts of fishing on the marine ecosystems are minimised and that the degradation of the marine environment is avoided (Article 2(3) of Regulation (EU) 1380/2013); and (ii) be coherent with EU environmental legislation (Article 2(5)(b).

Under the Habitats Directive[7], Member States must take measures to maintain natural habitats and species of wild fauna and flora of European interest at favourable conservation status or restore them to such status. The Birds Directive[8] requires Member States to take the requisite measures to maintain the population of the listed species at a level which corresponds in particular to ecological, scientific and cultural requirements, or to adapt the population of these species to that level. Scientific advice indicates that fisheries affect a number of species of cetaceans, birds, turtles and other fish species, all which fail to meet favourable conservation status as required under these Directives. Some vulnerable marine habitats have also been described and found in need of protection from fishing activity. Member States must implement mitigation measures to protect these species.

The Marine Strategy Framework Directive (MSFD[9]) has been in force since 2008. It requires Member States to set up national marine strategies to achieve, or maintain where it exists, 'good environmental status' by 2020. This status is based on 11 descriptors which cover ecosystems' health and the human pressures and impacts affecting them[10], all of which are relevant for the

[7] Council Directive 92/43/EEC.
[8] Directive 2009/147/EC.
[9] Directive 2008/56/EC.
Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC).
[10] Biological diversity (D1), food web structure (D4) and sea-floor integrity (D6) are maintained, while the impacts from non-indigenous species (D2), fishing (D3), excess nutrients (D5), changes in hydrographical conditions (D7), contaminants in the environment (D8) and in seafood (D9), marine litter (D10) and underwater noise (D11) do not adversely alter the marine ecosystems.

management of fishing activity. Implementing such a holistic approach and assessing sustainability requires management decisions that know and take into account ecosystem properties and human pressures (including from land-based or atmospheric sources). The MSFD therefore requires the development of integrated planning (which takes the form of marine strategies). The strategy is based, for each descriptor of good evironmental status, on criteria and parameters[11] to be assessed by each Member State and on the establishment of targets.

Against that background, Member States have to: (i) improve national data collection and scientific analysis and advice; (ii) manage the ecosystem impacts of fishing within the above-mentioned targets; (iii) ensure that mitigation or adaptation measures are taken by the fishing industry; and (iv) carry out enhanced and extended control and inspection activities.

By setting exploitation rates and establishing technical measures which define sustainable fishing practices, the Common Fisheries Policy addresses fishing pressures that impact commercial fish and shellfish stocks. The CFP also aims to ensure that negative impacts of fishing activities on the marine ecosystem are minimised. This relates to impacts on the abundance and diversity of marine life, marine food webs and ecosystems, and seabed habitats (relevant in particular for three other MSFD descriptors).

In addition, fisheries-generated litter such as discarded or lost fishing nets and other gear can cause habitat alteration. In the MSFD measures, most Member States link measures for marine biodiversity and commercial fish and shellfish to the CFP, though few did so for marine litter.

Annex I to the MSFD establishes that all commercially exploited fish and shellfish should be in safe biological limits. To measure that state, the MSFD makes use of the CFP concept of maximum sustainable yield. In this way, it promotes the use of CFP stock assessments and relevant multiannual plans, and the consultation of the appropriate scientific bodies. While information about fish stocks is available under the CFP and reported by Member States, other criteria such as the mortality/injury of species linked to incidental by-catches or physical disturbance to the seabed by fishing activities are not systematically reported by Member States, despite also being required. Putting into practice the MSFD objectives along with the CFP objectives and monitoring would improve the protection of commercial fish stocks, biodiversity and habitats. Also, establishing threshold values under the MSFD would facilitate the implementation of targeted measures, including measures under the CFP.

Marine litter is included among the descriptors under the MSFD with the aim that 'the properties and quantities of marine litter should not cause harm to the coastal and marine environment'. Marine litter represents a common challenge for all EU sea basins. Where there is abundance of spatial and temporal information, the magnitude of the problem becomes evident. In contrast, where there is almost complete lack of information, any assessment of the impact of the issue is difficult. Depending on the different needs, actions should target the improvement of the monitoring frameworks, as well as prevention to reduce the entrance of new marine litter into the environment. Actions to reduce new marine litter should especially target activities whose impact is evident and can be quantified (e.g. fisheries). At regional and inter-regional level, good practices need to be exchanged to achieve better results in monitoring and in prevention.

[11] Set in Commission Decision (EU) 2017/848, repealing Decision 2010/477/EU (OJ L 125, 18.5.2017, p. 43).

2 Providing conditions for an economically viable and competitive fishing sector and contributing to a fair standard of living for those who depend on fishing activities

2.1 Addressing overcapacity

The EU fleet is composed of 75% small-scale coastal fleet (SSCF) (around 49 000 vessels), 25% large-scale fleet (LSF) (around 16 000 vessels) and 0.4% distance-water fleet (DSF) (274 vessels). This composition remained relatively stable from 2008 to 2017. By contrast, fleet capacity decreased gradually by a yearly average of 1.7% in number of vessels and engine power (kW) and of 2.2% in tonnage (GT). While the Entry/Exit scheme (Article of 23 of the CFP Regulation) is fit for purpose as an instrument to prevent nominal fishing capacity from increasing, its effectiveness risks being undermined if Member States do not ensure accurate measurement, verification and reporting of the capacity indicators GT and kW[12].

Fleet capacity is not yet in line with available fishing opportunities. Since the entry into force of the 2013 CFP, 20 Member States have identified fleet segments whose fishing capacity is not effectively balanced with fishing opportunities and presented the necessary action plans. In 2018, 78% of all assessed fleet segments of the EU mainland fleet were found to be imbalanced[13], with a particularly high percentage in the Baltic (73%), Mediterranean (71%) and Black Sea (100%).

2.2 Consolidating economic and social performance

The economic results of the fleet are determined by a range of factors, and have improved over the past few years. The time and energy necessary to catch fish is gradually decreasing, while the available catches are increasing. Both the labour and capital productivity of the EU fishing fleet have increased since 2008, while employment has been decreasing on average 1.3% per year since 2008. Despite this, an increase in employment has been registered in a number of fleets in the North Sea and Atlantic in recent years and now seems to be consolidating, while the overall average wage is 27% higher than in 2008.

As a result of decreasing costs and increasing catches, revenue achieved an overall increase of 13% between 2008 and 2017. Increases in gross value added (GVA), gross profit and net profit recorded impressive overall improvements during the same period (+40%, +67% and +81% respectively), with net profit amounting to around 17%.

These continued improvements are mainly the result of high average fish prices (more value for fewer fish landed) and continued low fuel prices. The improvement in some important stocks, coupled with technological advances, have also contributed to the improvement in performance. However, results vary greatly by Member State, fishing activity and sea basin. The EU fleet as a whole generated a gross profit in 2017, but the fleets of four Member States fleets (Germany, Finland, Malta and Lithuania) continued to make losses.

[12] https://ec.europa.eu/fisheries/press/commission-publishes-evaluation-%E2%80%98entryexit-scheme%E2%80%99-eu-vessels_en

[13] Based upon the sustainable harvest indicator in the 2019 report of the Balance Expert Working Group, STECF-19-13.

2.3 Estimation of the impact of COVID-19 crisis on the fisheries sector

In the absence of other, more precise indications about the evolution of the relevant fisheries sectors, the European Economic Forecast *Summer 2020* (Interim) published by the Commission in July[14] provides an idea of the order of magnitude of the impact of the COVID-19 crisis and the subsequent recovery of all EU economies.

Table 1 Estimated impact of the COVID crisis on the GDP by MS, assuming no second wave (2020-21), %

Table 1: Gross domestic product, volume (percentage change on preceding year, 2001-2021) 30.6.2020

	5-year averages							Summer 2020 forecast		Spring 2020 forecast	
	2001-05	2006-10	2011-15	2016	2017	2018	2019	2020	2021	2020	2021
Belgium	1.9	1.5	1.3	1.5	1.9	1.5	1.4	-8.8	6.5	-7.2	6.7
Germany	0.5	1.2	1.7	2.2	2.5	1.5	0.6	-6.5	5.5	-6.6	5.9
Estonia	7.3	-0.3	3.3	2.6	5.7	4.8	4.3	-7.7	6.2	-6.9	5.9
Ireland	5.3	0.4	6.7	3.7	8.1	8.2	5.5	-8.5	6.3	-7.9	6.1
Greece	3.9	-0.3	-4.0	-0.2	1.5	1.9	1.9	-9.0	6.0	-9.7	7.9
Spain	3.3	1.0	0.0	3.0	2.9	2.4	2.0	-10.9	7.1	-9.4	7.0
France	1.7	0.6	1.0	1.1	2.3	1.8	1.5	-10.6	7.4	-8.2	7.4
Italy	0.9	-0.3	-0.7	1.3	1.7	0.8	0.3	-11.2	6.1	-9.5	6.5
Cyprus	4.0	2.7	-1.7	4.7	4.4	4.1	3.2	-7.7	5.5	-7.4	6.1
Latvia	6.2	-0.5	3.6	1.8	3.8	4.3	2.2	-7.0	6.4	-7.0	6.4
Lithuania	7.6	1.1	3.8	2.6	4.2	3.6	3.9	-7.1	6.7	-7.9	7.4
Luxembourg	3.9	3.4	3.9	4.6	1.8	3.1	2.3	-6.2	5.4	-5.4	5.7
Malta	2.1	2.0	5.7	5.8	6.5	7.3	4.7	-6.0	6.3	-5.8	6.0
Netherlands	1.9	1.4	0.7	2.2	2.9	2.4	1.7	-6.8	4.4	-6.8	5.0
Austria	1.8	1.3	1.1	2.1	2.5	2.4	1.6	-7.1	5.6	-5.8	6.0
Portugal	0.9	0.6	-0.8	2.0	3.5	2.6	2.2	-9.8	6.0	-6.8	5.8
Slovenia	3.6	1.9	0.4	3.1	4.8	4.1	2.4	-7.0	6.1	-7.0	6.7
Slovakia	5.0	4.9	2.6	2.1	3.0	3.9	2.4	-9.0	7.4	-6.7	6.6
Finland	2.6	0.9	0.1	2.8	3.3	1.5	1.1	-6.5	2.8	-6.3	3.7
Euro area	1.5	0.8	0.8	1.9	2.5	1.9	1.3	-8.7	6.1	-7.7	6.3
Bulgaria	5.7	5.2	1.8	3.8	3.5	3.1	3.4	-7.1	5.5	-7.2	6.0
Czechia	3.9	2.4	1.7	2.5	4.4	2.8	2.6	-7.8	4.5	-6.2	5.0
Denmark	1.3	0.2	1.3	3.2	2.0	2.4	2.4	-5.2	4.8	-5.9	5.1
Croatia	4.5	0.5	-0.2	3.5	3.1	2.7	2.9	-10.6	7.5	-9.1	7.5
Hungary	4.4	-0.2	2.1	2.2	4.3	5.1	4.9	-7.0	6.0	-7.0	6.0
Poland	3.1	4.8	3.0	3.1	4.9	5.3	4.1	-4.4	4.3	-4.3	4.1
Romania	5.6	3.8	3.0	4.8	7.1	4.4	4.1	-6.0	4.0	-6.0	4.2
Sweden	2.6	1.8	2.2	2.1	2.6	2.0	1.2	-5.3	3.1	-6.1	4.3
EU	1.7	1.0	1.0	2.1	2.7	2.1	1.5	-8.3	5.8	-7.4	6.1
P.M.: United Kingdom	2.8	0.5	2.0	1.9	1.9	1.3	1.5	-9.7	6.0	-8.3	6.0

Source: The European Economic Forecast Summer 2020 (Interim)[15]

For the fisheries sector, the expected impacts are different but in the order of magnitude. Moreover, impacts vary significantly by Member States. For the catching sector, the final outcome depends on a series of complex factors, particularly on the Council decisions for the fishing opportunities as well as operational costs, in particular the decrease in fuel costs (which represents a significant part of operating), and the demand for fish. These factors are the main contributors to significantly decrease and/or increase profitability of the sector.

In addition, based on the intelligence gathered through the market observatory (EUMOFA) during the lockdown, it can reasonably be expected that the evolution of the fisheries sectors could be better than that of the overall economy reported in Table 1, for a number of reasons:

- As essential activities, none of these sectors were brought to a complete halt, even during the worse weeks of the COVID-19 crisis (which started mid-March 2020). The activities faced serious difficulties, but were able to move along thanks to the efforts

[14] The details of the forecast can be consulted at: https://ec.europa.eu/info/sites/info/files/economy-finance/ip132_en.pdf

[15] Footnote 14 (p. 38).

and responsibility of the catching, aquaculture and processing sectors. Regarding processing, available information for the second fortnight of May shows that in many Member States the industry is back to stable production levels, close to normal capacity.

- Fuel prices collapsed to levels never seen in the past decades, significantly reducing fishing costs for the catching sector.
- The macroeconomic forecast took into account EU (including ECB) and Member States' monetary and fiscal policy stimuli (up until 23 April 2020). However, sector-specific measures, particularly the inclusion of specific emergency support measures in the EMFF and the Temporary framework for State aid measures to support the economy in the current COVID-19 outbreak, are not included because its corrective effects are not yet visible.

Further, Table 1 does not include the final outcome of Brexit as the outcome of negotiations remains uncertain.

Setting of fishing opportunities at sustainable level is the objective of CFP and is crucial for stock conservation and recovery. This is more than ever relevant for the potential recovery of the sector following the COVID-19 crisis.

The STECF's Annual Economic Report of the EU Fishing fleet compiles and estimates data at sea basin level for the catching sector. With the STECF's report on the EU aquaculture sector and the aquaculture production by sea basin, it can be estimated the aquaculture GVA and employment values by sea basin. The assignment of national figures to sea basins for the other sectors (distribution of fish products and processing of fish products) is not feasible since large parts of the wholesale and consumption activities take place in landlocked regions (e.g. two of the largest wholesale markets in Europe for fisheries products are Mercamadrid and Rungis, situated in Madrid and Paris).

Table 2 GVA for the EU fisheries sector, 2017, € million

Sea Basin	Primary production	Catching Sector	Aquaculture	Distribution of fish	Processing of fish	Total
Western Waters	2,184.2	1,491.9	692.2			
Baltic	240.6	112.0	128.6			
Mediterranean	1,704.9	1,068.7	636.2			
North Sea	846.2	679.3	166.9			
Black Sea	61.0	6.2	54.7			
Inland						
Total EU	**5,036.8**	**3,358.2**	**1,678.6**	**7,668.3**	**4,694.4**	**17,399.5**
p.m. NAFO		73.2				
p.m. OFR		1,183.8				

Notes: Land-locked countries are not included; OFR: Other Fishing Regions.
Source: STECF's 2019 Annual Economic Report of the EU Fishing fleet, The EU Blue Economy Report and Commission Services.

Table 3 Employment for the EU fisheries sector, 2017, thousand employees

Sea Basin	Primary production	Catching Sector	Aquaculture	Distribution of fish	Processing of fish	Total
Western Waters	74.0	45.2	28.8			

Baltic	18.0	8.5	9.5			
Mediterranean	69.8	49.6	20.2			
North Sea	7.5	5.1	2.3			
Black Sea	5.8	2.4	3.5			
Inland						
Total EU	**175.1**	**110.9**	**64.3**	**192.1**	**118.2**	**485.4**
p.m. NAFO		0.6				
p.m. OFR		18.1				

Notes: Land-locked countries are not included; OFR: Other Fishing Regions.
Source: STECF's 2019 Annual Economic Report of the EU Fishing fleet, The EU Blue Economy Report and Commission Services.

The Commission, together with the STECF, is currently working to estimate the impact of COVID-19 on the wild-capture fisheries in 2020. First estimates suggest an overall 12-16% decrease in the value of landings and GVA for the North Atlantic Ocean fisheries. The reduction of the fisheries activity has also led to a reduction in the employment measured in full time equivalents of the same order. The impact on other sea basins may be even larger. Estimates for the 2020 are planned to be part of the STECF's 2020 Annual Economic Report of the EU Fishing fleet.

Estimates of the impact of COVID-19 on the aquaculture sector will be presented in the STECF's report on the EU aquaculture sector in early 2021. However, preliminary information suggests that the impact of COVID-19 on the aquaculture sector is lower than in wild-capture fisheries.

3 Improving enforcement and control of fisheries and the provision of data

3.1 Investing in technological innovation and training for control and enforcement

It is the responsibility of Member States to monitor and control all fishing activities falling under the scope of the CFP and ensure that all catches are accurately reported. Member States are also responible for investigating and sanctioning infringements of CFP rules. Over the past 10 years, significant progress has been made within these areas: nearly all vessels above 15 metres transmit catch data via electronic logbooks and landing declarations (ERSs), while most Member States have set up effective vessel monitoring systems (VMSs) and dedicated fisheries monitoring centres (FMCs).

Most Member States are also adequately equipped with patrol vessels, surveillance aircraft and other traditional control means. Cooperation among Member States has improved through the European Fisheries Control Agency (EFCA). In addition implementation of Specific Control and Inspection Programmes (SCIPs) / Joint Deployment Plans (JDPs) is progressing, including through an extended scope of new SCIPs.

However, important challenges remain and are common to all sea basins. The quality of fisheries data must be further improved and more needs to be done to ensure that these data are shared systematically between national and European enforcement authorities without delay. Most Member States have not yet put in place effective control measures with regard to the implementation of the landing obligation. The control and monitoring of vessels operating outside EU waters (the external fleet) as well as the small-scale fleet must be strengthened. Several Member States must also take additional measures to ensure that provisions on the

weighing of landed fish and the verification of engine power[16] are properly and consistently implemented. Last but not least, more needs to be done to ensure that the Member States' enforcement and sanctioning systems are effective and sufficiently deterrent and there is room for improving the traceability of fish products. It is worth noting that the ongoing revision of the Control Regulation aims to address these challenges.

While traditional control means such as patrol vessels, surveillance aircraft, measuring and weighing equipment are still essential, they must be supplemented with improved and modernised data management and fisheries monitoring technology to effectively combat illegal, unreported and unregulated (IUU) fishing and achieve the objectives of the CFP. New technologies[17] can be used to improve: (i) checks of the landing obligation; (ii) checks on weighing; (iii) data management and reporting; (iv) risk management; (v) maritime and inland water surveillance; and (vi) traceability and monitoring of the small-scale fleet.

As data management and fisheries monitoring technology become more sophisticated, there will be an increased need for expertise. Currently, many Member States lack the necessary human resources and knowledge to take advantage of new and innovative data management and fisheries monitoring technologies. Hence, investment in hardware and software needs to be combined with substantial financing of knowhow at all stages of investment projects (development, implementation, and maintenance).

3.2 Stronger data collection for better scientific advice

Member States' collection of scientific data (technical, biological, economic and social) under the Data Collection Framework[18] overall has improved over the years in terms of coverage and quality. Results include a more accurate and in-depth analysis of the socio-economic situation of the European fleet[19] and aquaculture sector, and support the provision of more robust scientific advice on fish stocks.

Certain challenges persist. Some stem from new provisions under the revised Data Collection Regulation (2017). These involve in particular enhanced regional coordination and improvement of sampling methods and plans, in particular to collect more and better data on discards and unwanted catches in commercial fisheries, on incidental by-catches of sensitive species and on recreational and small-scale fisheries. In this respect, effective and fit-for-purpose systems to monitor the impact of fishing on protected and endangered species are still needed, while substantial modification of database schemes or introduction of new regional databases may imply further changes. Other challenges include: (i) coordinated improvement of quality checks of data; (ii) training of national data collection staff; (iii) work on stakeholder buy-in; (iv) optimising trips coverage by scientific observers on board fishing vessels; (v) a

[16] Study on engine power verification by Member States, Publications Office of the European Union, 2019, ISBN 978-92-76-08327-6.

[17] Various forms of remote electronic monitoring systems including CCTV, sensor data, automatic recognition software, artificial intelligence, surveillance drones, high resolution satellite imagery, internet connected systems and real-time transmission of records, improved systems for data analysis, data cross-checking, data sharing, 'big data' storage, RFID (radio-frequency identification), block chain technology, intelligent supply chains, and handheld ERS vessel positioning systems suited to small-scale fleet.

[18] Regulation (EU) 2017/1004, repealing Council Regulation (EC) No 199/2008.
Commission Implementing Decision (EU) 2016/1251 (notified under document C(2016) 4329).

[19] See the *2019 Annual Economic Report on the EU fishing fleet* https://stecf.jrc.ec.europa.eu/reports/economic/-/asset_publisher/d7Ie/document/id/2571760?inheritRedirect=false&redirect=https%3A%2F%2Fstecf.jrc.ec.europa.eu%3A443%2Freports%2Feconomic%3Fp_p_id%3D101_INSTANCE_d7Ie%26p_p_lifecycle%3D0%26p_p_state%3Dnormal%26p_p_mode%3Dview%26p_p_col_id%3Dcolumn-2%26p_p_col_pos%3D1%26p_p_col_count%3D2

harmonised approach to socio-economic data collection; and (vi) data confidentiality issues for smaller fleet segments.

Additionally, some sea basins or individual Member States face specific challenges like timeliness of research surveys, spatial or temporal gaps in current survey planning, data gaps and data transmission issues. These significantly impact the stock assessment and the socio-economic analysis, with a knock-on effect on fisheries and overcapacity management. Some require stronger expertise, both in research as in data validation, raising and modelling. The outermost regions face very specific challenges due to their distant location and their biodiversity hotspots, and limited access to regional coordination and knowledge sharing platforms. Consequently, the need for more and better data collection on their fisheries and marine ecosystems persists, despite the efforts to cater for these needs.

4 Promoting a sustainable and profitable aquaculture

4.1 Diversifying production and increasing value

Ensuring the growth of a diversified sustainable and competitive EU aquaculture is important in the context of broader objectives such as the decarbonisation of food systems and the need to provide high-quality protein to consumers.

EU aquaculture production has been stagnant in the last decades. From 2014, production recovered and an overall increase in volume and value is observed since then, however mainly explained by an increase in production value and volume of high-value species like salmon, seabass and seabream (while a decrease in production was observed for example for mussels). As a result, overall profits doubled between 2014 and 2016. Despite this improvement, the growth of EU aquaculture production remains slow and uneven across species and Member States.

EU aquaculture production is very concentrated in terms of species produced: salmon, mussel, seabass, seabream and oyster account for more than 80%. The production of carpet shell and oyster is also material. It is also very concentrated in terms of producing Member States: aquaculture in Spain, France, Italy and Greece represent the vast majority of EU production. Nevertheless, some other Member States play a role as well.

However, space limitation is a major constraint. Efforts are therefore needed to identify and map the most suitable areas for expansion of aquaculture. The possibilities of developing aquaculture further offshore and in windmill parks (notably algae and shellfish) need to be further explored.

Given the high concentration of EU production in a limited number of species and increasing competition from imported production, there is a need to diversify production. Producing more lower trophic level species (shellfish and other invertebrates, algae) can contribute to reducing the overall environmental footprint of the sector, and also offers potential to provide environmental services in terms of carbon capture and removal of nutrients from the water. In addition, there is potential for developing alternative forms of production techniques (e.g. energy-efficient Recirculating Aquaculture systems, Integrated Multi-trophic aquaculture) and new products. Diversification to new products (e.g. processing into fillets, ready-to-cook products) is particularly important in the case of some traditional aquaculture production methods (e.g. pond aquaculture) and also to meet the demand of younger generations of consumers.

There is also a need to differentiate EU products. The EU's high production standards on environmental protection, animal health and welfare and public health and safety should provide a competitive advantage for EU aquaculture. However, this requires making the quality

of EU aquaculture and its other higher standards more well-known among consumers, with the involvement of producers and retailers. Promotion of local and quality labels subject to appropriate control can also contribute to the differentiation of aquaculture products. Support to the establishment and work of producer organisations (including transnational producer organisations) and inter-professional organisations across the value chain is important in this respect.

Further guidance on all the relevant aspects to promote the sustainable development of EU aquaculture will be provided by the Commission in the new Strategic Guidelines under preparation.

4.2 Ensuring environmental protection and climate adaptation

Growth in production needs to be environmentally sustainable, contribute to reducing greenhouse gas emissions and to the mitigation of the impact of climate change. It is therefore essential to improve EU aquaculture's environmental and energy performance. This concerns measures to reduce the environmental footprint of aquaculture activities and the promotion of environmentally-friendly practices such as multi-trophic aquaculture systems, substituting current feed sources with more sustainable alternatives, promoting diversification to low-trophic and unfed species, taking actions on circular economy and energy efficiency, and the valorisation of aquaculture offering environmental services (e.g. carbon sequestration, preservation of ecosystems). The establishment of transparent and uniform environmental monitoring plans and the reporting and collection by competent authorities of data on environmental indicators of aquaculture activities (inter alia, discharges and emissions (organic matter, nutrients, veterinary medicines, escapees, and water exchanges) is important to limit the environmental footprint of aquaculture systems and also to ensure social acceptance. It is also worth exploring spatial planning that combines production with restoration, and incentives attaching value to reduction of the release of nutrients to the environment.

Strengthening the resilience of aquaculture to climate change is a key and significant challenge. The aim should be to decrease reliance on a limited number of species, to diversify production into species more resilient to climate change impact, and to increase resilience to extreme weather events and variable conditions that impact coastal-dependent and inland aquaculture. Certain types of aquaculture which help in preserving ecosystems that mitigate the impact of climate change (e.g. ponds and wetlands, which protect against floods and coastal erosion) should be promoted.

All these aspects require support for research and innovation, as well as skill development. Establishing links between producers, public authorities and scientific institutions is important if research and innovation is to be translated into actual improvements.

5 Enabling climate change adaptation and mitigation

The Commission has proposed that the 2021-2027 EMFF contribute to achieving the overall target of 25% of the EU budget supporting climate objectives. In this respect, 30% of the overall financial envelope of the EMFF is expected to contribute to actions supporting climate objectives. The seafood sector will be directly impacted by climate change. It is projected to drive fish stocks poleward and to reduce the productivity of the seas in temperate latitudes. In addition to better understanding the consequential changes in stock distribution, fleet adaptation measures and new marketing strategies need to be envisaged in areas where ecosystem changes cause replacement of traditional fisheries.

Like all economic sectors, the fisheries industry will need to reduce its carbon emissions. Accelerating gains in the energy efficiency of fisheries (which are responsible for about 20% of maritime emissions) would be possible by reaching the lower bound of F*msy*, promoting the use of low-carbon fishing techniques, incentivising the use of low-carbon fuels and investing in research and innovation into the design of zero-carbon technologies and vessels. The downstream sectors – fishing ports, fish processing factories, transport and retail – should also increase their energy efficiency by converting to renewable energy sources or investing in energy efficient installations to reduce carbon emissions.

Through its low carbon footprint and ecosystem services, aquaculture has the potential to relieve the environmental pressures of food production from land and sea resources. This will, however, require support for innovation and investment, not only for productive investments, but also to decrease aquaculture's carbon and environmental footprint and increase its resilience to climate change.

These adaptations will need cross-cutting tools and policies. Further development of the national maritime spatial plans under the umbrella of the EU Maritime Spatial Planning Directive[20] can help tackle the challenges arising from the large increase in the use of the seas expected from the expansion of windfarms, aquaculture and related installations. The development of marine protected areas and fisheries restricted areas can help support climate change adaptation and mitigation targets, while integration of the numerous monitoring and observation systems would help coastal communities anticipate and mitigate storm and flood events. Research, adaptation and mitigation measures will also be needed to mitigate the effects of coastal erosion, sea-level rise and wetland degradation, and to limit stressors and restore coastal ecosystems.

6 Improving the value chain and marketing of fishery and aquaculture products

EU fish consumption (25 kg per capita per year) is above the world average, is increasing and is not covered by EU production. Besides, consumption is concentrated on a small number of species. Imports have increased significantly since 2013, resulting in a record trade deficit in 2017 (EUR 20.2 billion). The top five species consumed in the EU (tuna, cod, salmon, Alaska pollock and shrimps), which represent 43% of total consumption, were mostly imported from non-EU countries.

As a consequence, the EU market is highly dependent on the global market and on global price trends, where demand is also increasing, thus pushing up prices. In the 2010-2017 period, consumer fish prices increased on average by 3% per year, while over the same period the prices of meat and other foods remained relatively stable.

For EU consumers, the appearance and cost of seafood products are important purchasing factors. They consider that they would eat more seafood if they had a better choice and if sale points were more diversified. These are opportunities to add more value to underexploited species and aquaculture products, to develop new products on the basis of existing and new species and to develop new sales channels.

There has been a significant increase in the number of quality certification schemes. Organic production of seafood almost doubled from 2013 to 2017 and the number of EU quality schemes (geographical indications and traditional specialties guaranteed) jumped from 19 to 53 between 2009 and 2019. However, this increase is mainly driven by business-to-business

[20] Directive 2014/89/EU.

demand, mostly from retailers, while organic products remain a niche market (3.9% of the total volume). Nevertheless, consumer awareness and expectations regarding quality, sustainability and traceability are increasing. The Farm to Fork Strategy sets the objective of 'a significant increase in organic aquaculture production'[21]. Quality certification schemes can add value and help consumers to make better-informed choices, provided they avoid ambiguity or confusion and are accompanied by proper control mechanisms.

Producer organisations (POs) are key stakeholders in improving the functioning of the supply chain. They support the day-to-day management and implementation of the CFP by producers and promote viable and sustainable activities by their members. In this latter area, producer organisations help their members avoid or reduce unwanted catches and, where necessary, make the best use of such catches. This contributes to traceability, to clear and comprehensive consumer information, to the elimination of illegal, unreported and unregulated fishing, to improving conditions for the placing on the market of their members' products and to better economic returns.

The main tool for POs are the production and marketing plans (PMPs), which set out marketing strategies. PMPs are mandatory for the main marketed species of each PO. They are submitted by the PO and adopted by the national competent authorities.

In the face of the high structural concentration of the retail sector and of the processing industry, there is an interest in promoting the restructuring of POs, in creating new POs and in pooling resources, for example to allow fishers to collectively manage quotas and/or to reach community-level objectives. Adequate financial support is essential for POs to implement their PMPs, both as an incentive for their creation and development and to offset part of the costs incurred in implementing this mandatory tool. The creation of inter-branch organisations involving fishers and farmers, processors, distributors and the marketing chain is also a useful tool that should be promoted.

These challenges apply across the EU, as the processing and marketing seafood products are fully integrated in the internal market. Therefore no regional analysis is provided in this document.

7 Fostering the local development of a sustainable blue economy in coastal areas

Coastal areas face challenges that justify the need for integrated development strategies through local partnerships. They all face territorial challenges in the form of a growing competition for the use of marine resources, and most of them lack preparation for the opportunities offered by the growth of the blue economy. Many coastal communities suffer from the depopulation of fisheries- and aquaculture-dependent areas, often linked to the marginalisation of small-scale coastal fisheries. As a result, most areas which have traditionally been dependent on fisheries and/or aquaculture struggle to find alternative/complementary economic activities.

The effects of the sectoral challenges highlighted above often concentrate at territorial level. It is only through multi-stakeholder partnerships and tailor-made governance frameworks that solutions can be found to the problems of: (i) fishing pressure on stocks and the need for effective conservation measures; (ii) the low profitability of the SSCF; (ii) the ageing workforce and challenge to retain younger people; (iii) the competition for space; and (iv) societal acceptability of fish farming.

[21] COM (2020) 381 (final).

Similarly, environmental challenges, which often have a global character, are acutely felt at territorial level, be it eutrophication of quasi-closed seas (the Baltic and Black Seas), coastal erosion, impacts of climate change, marine pollution or biodiversity loss. Action at territorial level plays an essential role in tackling these issues.

At the same time, two fifths of the EU's population (214 million people, or 41.8% of EU residents) live in a coastal region and the broader economy of coastal regions is often very dynamic. Within it, the blue economy provides an important source of revenue and employment across the EU, although with an estimated 5 million people directly employed in the established sectors of the Blue Economy in the EU. The direct employment linked to the established blue economy sectors represents 4.7% of the employment in coastal regions.

To facilitate cross-sectoral approaches, encourage regional cooperation and involve competent regional authorities and stakeholders, the European Commission has supported the development of several sea basin strategies in the Atlantic, the Western Mediterranean and the Black Sea. Two macro regional strategies have also a strong maritime focus: the EU Strategy for the Baltic Sea Region (EUSBSR) and the EU Strategy for the Adriatic and Ionian Region (EUSAIR). Outermost regions are also developing their own blue economy strategies. Under these different frameworks, Member States have identified priorities for the development of sustainable blue economy. These priorities should guide use of the different EU structural funds, including the EMFF.

In this context, Community-Led Local Development (CLLD) is an opportunity to contribute to the bottom-up development of the blue economy. This can be achieved by identifying innovations that can lead to a transition towards smarter growth in coastal areas and by ensuring the involvement of local stakeholders in the development of the blue economy of the future.

Fisheries Local Action Groups (FLAGs) can also contribute to a more sustainable approach to fisheries management. Better conservation can be supported by community management of fishing rights and promoting lesser-known species, while profitability can be increased by boosting innovation along the value chain, capturing locally more of the added value.

Blue biotech offers many possibilities for innovating at local level. With their local ecological knowledge, coastal communities are well placed to tap into this opportunity, supporting projects in the food industry and non-food industries. Biomass from algae and seafood by-products (e.g. fish skin, shells) provides great potential in this respect.

Niche tourism is a growing area away from large-scale touristic developments. It offers fishers and aquaculture farmers the possibility to diversify their activities by providing tourism activities linked to their production. Local SMEs can develop innovative products by tapping local assets.

There is also room for improving environmental actions through CLLD. There is an interest and a need to promote greener projects aimed at preventing environmental damage. These can take the form of climate change mitigation actions and the adoption of circular economy principles contributing to a reduction of emissions and pollution. In addition, a growing awareness of environmental issues in the general public will provide new opportunities for fisheries-dependent areas, such as the marketing of local products sourced sustainably and with a low carbon footprint. FLAGs can also support fishers as they take a more active role in protecting the maritime environment.

FLAGs are already involved in ensuring better integration of fisheries and aquaculture-dependent communities in territorial development as part of their activities. The role of FLAGs will grow in the future, especially in areas where development of the blue economy may increase competition for the use of marine resources and where processes such as Integrated

Coastal Zone Management (ICZM) or Maritime Spatial Planning are key to securing a sustainable development of the blue economy. FLAGs can also support the development of participative resource management processes (co-management) or contribute to solving usage conflicts such as those involving protected species and marine protected areas.

Another challenge is the depopulation of many fisheries-dependent areas and an ageing workforce in the fisheries sector. This requires better economic and social integration of the different categories of the population in local communities. CLLD can contribute by providing basic services to the community, making sure women take a more active role in the local economy, involving young people and marginalised groups in the development of local areas, addressing skill shortages, reviving empty housing and creating new economic and social-cultural activities.

BALTIC SEA

1. Scope

The Baltic Sea covers ICES areas 3b, 3c and 3d and is bordered by the Swedish part of the Scandinavian Peninsula, mainland Europe and the Danish islands. The central part of the Baltic Sea is bordered on its northern edge by the Gulf of Bothnia, in the north-east by the Gulf of Finland, and in the east by the Gulf of Riga. Nine Member States have fleet segments active in the basin: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, the Netherlands, Poland and Sweden[22].

The Baltic Sea is the youngest sea on the planet. It is almost enclosed, experiencing near-arctic conditions. It is characterised by strong temperature and salinity gradients, from relatively warmer and saline waters in the south-western part to cold and almost freshwater in the northernmost parts. The Baltic Sea is one of the largest brackish water bodies in the world, and in its most northern and eastern parts, conditions are close to those of freshwater. It is a semi-enclosed shallow sea with an average depth of 60 m, where one third of the area is less than 30 m deep. This ecoregion has many islands and a long and diverse coastline, especially in the northern areas. In addition, there is strong permanent vertical stratification for most of the

[22] Due to its low activity, the Dutch fleet is generally excluded from further analyses. Socio-economic results exclude the German pelagic trawl segment due to insufficient data.

Baltic Sea. The northernmost parts are sometimes covered by ice in winter. The Baltic Sea supports unique ecosystems, faces very specific eutrophication challenges and is particularly vulnerable to algal blooms and hazardous substances.

2. Ensuring sustainable management of natural resources

In 2017, the most important species (in volume) were herring (338 811 tonnes, 52.3% of the landed weight), sprat (253 361 tonnes), followed by cod (26 899 tonnes) and flounder (15 020 tonnes). Herring generated the highest value (EUR 95.2 million, representing 45% of the landed value), followed by sprat (EUR 51 million, 24% of the landed value) and cod (EUR 32.5 million, 15% of the landed value).

2.1 Applying the precautionary approach and achieving maximum sustainable yields

Status of stocks in the Baltic Sea (source: STECF report 'Monitoring the performance of the CFP', STECF-Adhoc-19-01)

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of stocks for which fishing mortality (F) exceeded F_{MSY}.														
7	6	6	6	6	6	6	5	5	5	4	3	6	5	7
Number of stocks outside safe biological limits														
6	6	6	6	5	5	5	5	5	4	4	4	4	3	3
SSB relative to 2003														
1.00	1.06	1.14	1.13	1.08	0.96	0.96	0.97	0.94	0.98	1.03	1.15	1.16	1.19	1.24

Strengths

Some of the biological resources in the basin are fished at sustainable levels. Sprat stocks appear to be healthy and exploited below maximum sustainable yield (MSY). In the central Baltic, the Gulf of Riga and the Gulf of Bothnia, the herring stock also appears to be in good condition and was exploited below the MSY.

Challenges

In the Western Baltic, several important stocks are exploited above the MSY; these include eastern and western cod, central and western herring, sprat and plaice in subdivisions 21 to 23. Until 2012, the eastern cod stock was considered to be sustainably exploited. However, after good recruitment years and increases in the stock population in 2012-2013, the mean weight of larger cod in the eastern Baltic declined and ICES changed the status of the eastern cod stock in 2014 from sustainably exploited to unknown. Since then, the eastern cod stock has experienced constant decline and ICES recommended closing the fishery in 2020.

The situation is unprecedented as the eastern Baltic cod stock is the only stock in European waters for which ICES assesses natural mortality from environmental pressures to be about three times higher than fishing mortality. The eastern Baltic cod stock is not expected to recover before 2024, even with no fishing at all. Therefore, given the above situation, the Commission adopted first emergency measures in July 2019 prohibiting the fishing of eastern Baltic cod until year end, with the Council deciding in October 2019 on unprecedented fishing restrictions for 2020. These exceptional measures will lead to redundant fleet capacities and to severe adverse socio-economic consequences for the related coastal communities and fishing businesses.

The structural adaptation of the fleet in the Baltic Sea needs to be consistent with the conservation objectives laid down in the Multiannual Management Plan. To achieve this, support for the permanent cessation of fishing activities through the scrapping of fishing vessels that have significant dependence on eastern Baltic cod should be strictly conditional on, and

linked to, meeting the adjustment targets and tools included in the action plans for imbalanced segments.

Similarly, for the Bothnian Sea herring stock, ICES advises that when the precautionary approach is applied, catches in 2020 should be no more than 65 018 tonnes, corresponding to a 30% decrease in quota. Gulf of Finland salmon is being closely monitored, as is main basin salmon, with evidence indicating that action is needed to improve the stock status in the weakest salmon rivers. The status of European eel continues to be critical.

There are around 10 million recreational fishermen in this sea basin. While they bring significant and important economic benefits to local communities, they also clearly have a high impact on fisheries resources.

2.2 Implementing the ecosystem-based approach to fisheries management

Strengths

Scientific knowledge on the structure and functioning of the ecosystems is steadily improving. Recently, ICES started providing ecosystem overviews and integrated ecosystem assessments. ICES also provides an overview of the multi-species interactions that allows for more targeted management measures. This additional scientific background is used to further inform the fisheries management decisions relevant for this sea basin. Such scientific background could be used in the development of maritime spatial planning initiatives, which would allow for a more balanced exploitation of the ecosystem by the various human activities.

Challenges

Abrasion of the seabed by mobile bottom-contacting fishing gears has been investigated to describe the extent, magnitude and effects of fishing on benthic habitats. Mobile bottom-contacting gears are primarily used in the southern Baltic Sea. This is mainly abrasion from otter trawls targeting demersal and benthic fish. Abrasion may affect the surface (top 2 cm of sediments) or the subsurface (> 2 cm). Fishing gear disturbances of the sea bottom damage benthic communities, but little is known at the regional scale about the sensitivity of different Baltic Sea organisms and communities to these impacts. ICES is developing an assessment procedure based on biological principles. Secondary effects of bottom trawling include smothering and resuspension of sediment and nutrients, as well as foodweb effects, but these are difficult to evaluate compared to primary effects.

All fisheries have the potential to catch protected, endangered or threatened species such as seabirds and marine mammals as non-targeted by-catches[23]. Seabirds can become entangled in gillnets or hooked on longlines and consequently drown. Seals can be caught in submersed trapnets and harbour porpoises become entangled in gillnets, leading to their death. The only cetacean species to occur regularly in the Baltic Sea is the harbour porpoise. Its Baltic Sea subpopulation has declined in the past 50–100 years. With the most recent estimation at around 500 individuals, this subpopulation is listed as critically endangered[24].

Abandoned, lost or otherwise discarded fishing gear are an unsolved problem. Such gear may continuously catch fish, birds and marine mammals for a long time after leaving a fishing boat.

[23] Studies conducted between 1980 and 2005 indicated that at least 76 000 birds, mostly sea ducks, were killed annually in Baltic Sea gillnets. This number may have declined in more recent years, probably due to the decline in sea duck populations. Birds that actively pursue their prey underwater were more susceptible than those that graze on the benthos.

[24] The more western Belt sea subpopulation in subdivision 22 has a much higher abundance, estimated at around 40 000 individuals.

It was estimated that 0.1% of nets are lost annually in the Swedish Baltic Sea gillnet fishery. While the impact on the environment is not quantified, there is information that fishing pressure exerted by lost static nets could range from 20% of its usual net capacity after 3 months down to a maximum of 6% after 2 years. Fisheries have a large impact on the upper trophic levels of the Baltic ecosystems. In the eastern Baltic, this impact has been shown to cascade down the foodweb, indirectly affecting the lower trophic levels[25]. There is further indication that this trophic cascade could also have facilitated the observed increase in phytoplankton biomass and therefore worsened eutrophication.

2.3 Eliminating discards and making the best use of unwanted catches

Strengths

Historically, discards of pelagic species are negligible in the Baltic Sea, as both sprat and herring are target species, with other by-catches (e.g. of sticklebacks, Gasterosteidae) landed for industrial purposes. Discard rates are rather minor for static coastal gears and even lower for pelagic trawls.

Challenges

Discarding still occurs in the Baltic Sea, although it is illegal for the major commercial fisheries. For example, for the eastern Baltic cod stock, discards were still estimated at 3 238 tonnes in 2017, despite an obligation to land all catches since 2015. Discarding was at similar levels in 2016 and constituted 11% of the total catch in weight.

2.4 Ensuring coherence with environmental legislation

Strengths

According to the Baltic Marine Environment Protection Commission – Helsinki Commission (HELCOM), there are 176 HELCOM Marine Protected Areas (MPAs), covering 49 016 km² of marine surface, roughly equivalent to 11.8% of the Baltic Sea marine area[26]. Including designated Natura 2000 areas, the Baltic Sea basin is one of the basins with the widest coverage of MPAs[27].

Challenges

Many species and habitats of the Baltic Sea are not in good condition, according to recent assessments. HELCOM identifies harbour porpoise as being in low conservation status and diving ducks having negative trends. Both species are at risk of being caught in gillnets (porpoises) and static nets (diving ducks), but their population and the impacts of fishing are poorly quantified. For porpoises, known mitigation measures include the use of acoustic deterrent devices and closed areas to prevent fishing in areas of harbour porpoise abundance. Work on technical mitigation measures to scare ducks away from static nets has not yet found a working solution and so needs to be continued. In the absence of a technological solution, the use of closed areas to prevent fishing with static gear in ducks' main feeding grounds has proved a useful solution. More survey work to identify the right areas and times for such closures is needed, as well as more consultation work and extension work with the fishing sector.

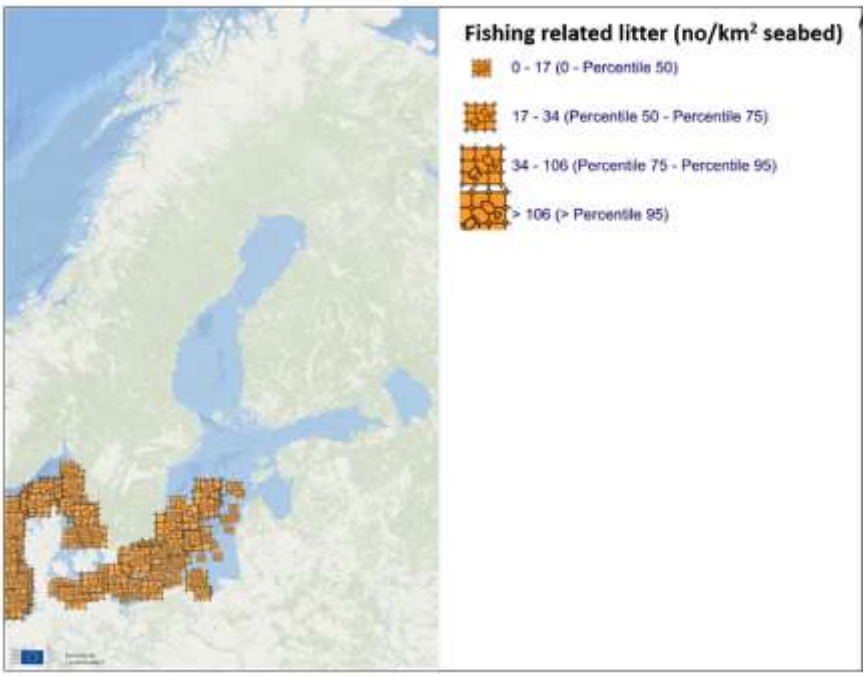
[25] For example, the reduction of the eastern Baltic cod stock in the late 1980s has favoured the increased biomass of its main fish prey, sprat, and in turn the decrease in the summer biomass of zooplankton in the Baltic proper. This has provoked a decline in the body condition and growth of both sprat and herring.

[26] www.helcom.fi/action-areas/marine-protected-areas/basic-facts/

[27] www.eea.europa.eu/publications/marine-protected-areas

Other key pressures include nutrient overloading[28], which has decreased, but remains a problem. Climate-driven changes in water temperature (including changes in ice cover) and salinity will have an increasing influence on the ecosystem's structure and function. Contaminant levels remain high and the rate of observed introduction of non-indigenous species has more than doubled in the 21st century. In addition, disturbance of seabed habitats due to physical abrasion from fishing may reduce benthic diversity and biomass. Selective extraction of species also remains a problem.

Marine litter is a significant problem in the Baltic Sea. Although Member States' interest in using EU funding to involve the fishing industry in reducing marine litter has increased, one issue of utmost importance is that not all the sea basin is monitored with the same temporal and spatial intensity, resulting in gaps in information, especially in the northern part of the Baltic. The marine litter originating from fisheries and other human activities is a very significant pollution source. Some coastal areas may be more vulnerable to the deposition of marine litter due to the circulation patterns in the Baltic. Actions should be targeted at: (i) effectively reducing the loss of fisheries equipment which ends up in the coastal areas and on the seafloor; and (ii) intensifying monitoring and collection efforts, both in areas where information is completely missing and in areas that face already intense marine litter problems.



Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas

Density of fishing-related seabed litter (number of items per km²) in the Baltic Sea per trawl, per year, obtained during monitoring serveys (data availability: 2007-2018)

[28] Increased levels of nitrogen, phosphorus, silicon (and iron) in the marine environment.

Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas

Density of plastic bag-related seabed litter (number of items per km²) in the Baltic Sea per trawl, per year, obtained during monitoring serveys (data availability: 2007-2018)

3. Improving enforcement and control of fisheries and the provision of data

3.1 Collection of scientific data

Strengths

Data collection is well established for the Baltic Sea basin. All Member States concerned have an institutionalised operational data collection management system in place for more than a decade. The collection of both fisheries-dependent data and fisheries-independent data covers all the relevant areas Member States need to report on. Despite some reported problems (e.g. shortage of observer programme coverage), the Member States in the Baltic Sea basin have carried out data collection activities during the 2014-2020 EMFF period in a satisfactory manner and have responded to data calls from scientific end users.

The Regional Database (RDB) hosted by ICES is a strong tool in support of data collection evaluation both for the Regional Coordination Groups (RCGs) on data collection organised per sea basin at EU level and for ICES as end user. Due to the variety and number of fisheries, some Member States have shown minor difficulties in reaching deadlines or replying using the correct format to certain data calls. However, data are collected, and these Member States are collaborating with end users and the Commission and improving their performance when responding to data calls.

Within the region, cooperation among Member States is mainly driven by the RCG Baltic, in strong collaboration with RCG North Atlantic North Sea and Eastern Arctic (RCG NANSEA). Although the RCG Baltic continues to hold separate meetings, common terms of reference and a common tasks plan for the next 3 years were established during 2019. In this context, Member States are coordinating in a number of areas, including: (i) update of data collection

requirements; (ii) joint data collection methodologies and approaches to respond to data calls (enhancing consistency); (iii) strong cooperation on scientific surveys by dedicated vessels; (iv) improved quality checks before uploading data; and (v) regional database use.

Challenges

Sampling methods need to be further improved to live up to the ambition of the 2017 EU Data Collection Regulation[29], in particular for discards, unwanted catches, incidental by-catches of listed prohibited and sensitive species by commercial fisheries, and for data collection based on pilot studies planned under the current EU-MAP on recreational and small-scale fisheries. In this regard, specific information on salmon is needed from both commercial fisheries and recreational fisheries. The fishPi2 project commissioned for the whole of the Atlantic EU waters involves and applies to the Baltic Sea in an indirect way, and sampling programmes are being discussed at regional level. Similarly, positive experience from pilot studies developed by individual Member States in the above-mentioned fields[30] also needs to be integrated into the mainstream data collection activities for the specific fields, in particular under a new EU-MAP for data collection. Timely implementation of research surveys carried out in the region is also important.

Member States upload data to the RDB hosted and maintained by ICES. Scientists, including ICES staff, are developing a new database called RDBES (Regional Data Base and Estimation Sampling). This is a promising tool that will improve the quality of the data used in the scientific advisory process and facilitate Member States' submission of annual reports to the European Commission. However, the change to another database may involve modifications in the Member States' sampling methodology. This is a challenge to address regionally.

New obligations on data collection for sensitive species have been introduced in the Technical Measures Regulation[31], which requires Member States to take the necessary steps to collect scientific data on incidental catches of sensitive species. Advice on sampling of by-catches of cetaceans has been provided by the STECF[32] and advice on sampling of all sensitive species is also available from ICES. Compliance with this requirement involves increased efforts on data collection, observer coverage and on-board electronic monitoring.

Continued challenges in the field of data collection are:

- further coordinated improvement of quality checks (including relations with the RDB in ICES);
- training of national data collection staff;
- work on stakeholder buy-in (notably buy-in from fishers as regards filling out logbooks in a reliable manner);
- increasing coverage of observer trips;
- avoiding data gaps that have a significant impact in stock assessment and management of the region;

[29] Regulation (EU) 2017/1004.

[30] Recording of the catch of seabirds and mammals has been undertaken in some Baltic Sea fisheries, usually where there is a perceived risk of such by-catches.

[31] Regulation (EU) 2019/1241, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.

[32] Scientific, Technical and Economic Committee for Fisheries (STECF) – Review of the implementation of the EU regulation on the incidental catches of cetaceans (STECF-19-07).

- applying the developed recreational fisheries sampling plans, especially for western cod in Danish waters, thus building the necessary time series to be used for stock assessment.

Regional cooperation between Member States in the context of the RCG also remains a challenge.

3.2 Enforcement and control

Strengths

In general, the control systems in the Baltic Sea are fairly robust, and some Member States are making efforts to implement new control technology. Also, the control requirements in the multiannual plan for cod, herring and sprat go beyond the requirements of the Control Regulation.

Challenges

As in the other sea basins, the implementation, control and enforcement of the landing obligation is the main challenge. Also, while some important measures have been already taken (e.g. multiannual plan), more needs to be done to further improve the monitoring of the small-scale fleet. The quality of catch data is an issue in some Member States, for example as regards salmon fisheries. Another area of concern is the control of recreational fisheries, as vessels are often allowed to use professional gears but without having to have licences or undergo vessel tracking and catch reporting. Furthermore, more needs to be done to carry out effective controls of engine power, either by carrying out physical verifications and/or by using modern technologies such as the installation of devices enabling continuous monitoring of engine power. Finally, like in other sea basins, the control of sales channels and traceability of fish must be strengthened.

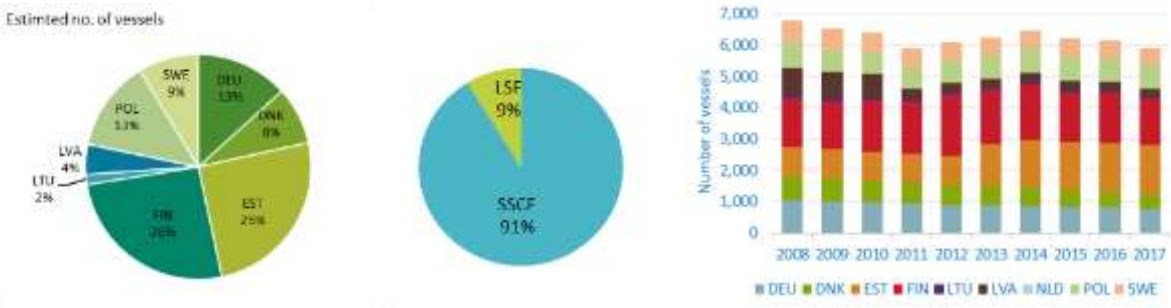
4. Ensuring a balanced socio-economic outlook for the fisheries sector

Overall, the number of vessels operating in the Baltic Sea has followed a downward trend since 2014. The number of vessels decreased steadily between 2008 and 2011, mainly as a result of capacity reductions in the Latvian and Polish fleets, but rose again with the entry of Finnish and Estonian vessels in 2013 and 2014. The total fleet amounted to around 5 900 active vessels in 2017, a decrease of 4.3% on 2016 and the lowest level since 2008. 92% of vessels (5 418 vessels) were small-scale vessels. The large-scale fleet consisted of 482 vessels, 11% less than in 2016. The Estonian fleet was the largest with 1 587 active vessels, some 27% of the total.

Trends on the number of vessels for fleets operating in the Baltic Sea

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[33]

[33] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 131).



Data source: Member States' data submissions under the EU Data Collection Framework (DCF) 2018 Annual Economic Report on the EU Fishing Fleet (MARE/A3/AC (2018)).[34]

Share of the Baltic Sea fleet capacity by Member State and by fishing activity, 2016

4.1 Providing conditions for an economically viable and competitive fishing sector

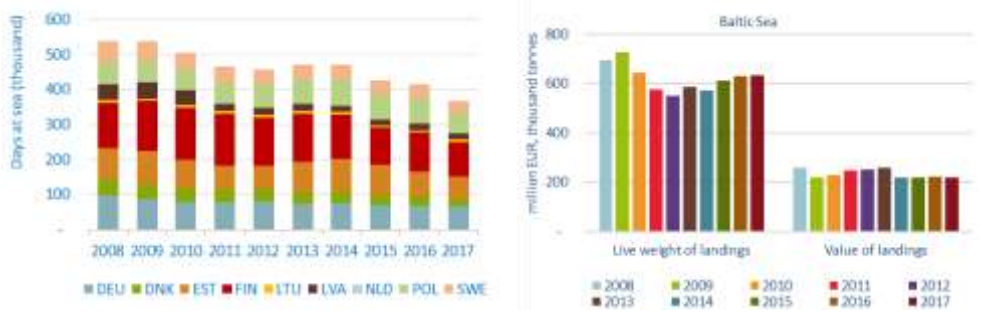
Strengths

Effort trends in the region more or less reflect trends in fleet capacity. In 2017, the total number of days at sea was 32% less than that in 2008 and 11% less than in 2016 (368 431 days). The biggest reductions were seen in the Latvian, Danish and Swedish fleets. Vessels from Finland had the highest effort, accounting for 27% of total days at sea. Most (85%) of the effort resulted from the small-scale coastal fleet. Within the large-scale fleet, most of the effort was deployed by pelagic trawlers.

In parallel, landings (in weight) declined between 2009 and 2012, followed by a slight increase in 2013 and further increase after 2014. Conversely, the value of landings increased steadily from 2009 to 2013, decreased significantly in 2014 (due to a slump in the price for small pelagic) and had still not entirely recovered in 2017. 93% of the total weight and 79% of the total value was landed by the large-scale fleet. Despite the reduction in effort during 2017, the volume of landings increased by 1% compared to 2016. However, the value of landings decreased by 2%.

Trends on landings for fleets operating in the Baltic Sea region

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015)[35]

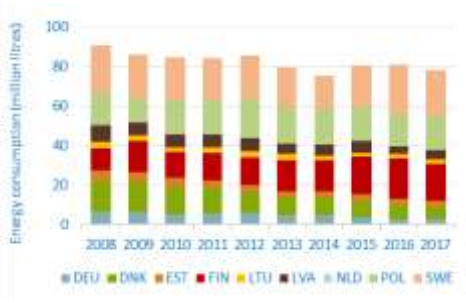


Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[36]

Trends on effort (in days at sea) for fleets operating in the Baltic Sea

[34] Scientific, Technical and Economic Committee for Fisheries (STECF) – The 2018 Annual Economic Report on the EU Fishing Fleet (STECF-18-07). Publications Office of the European Union, Luxembourg, 2018, JRC112940, ISBN 978-92-79-79390-5, doi: 10.2760/56158 (p.129).
[35] Footnote 33 (p. 129).
[36] Footnote 33 (p. 132).

Fuel consumption has decreased since 2008, but rose between 2014 and 2016. Energy costs continue to be one of the main expenditure items for the large-scale fleet, especially demersal and pelagic trawlers. Consequently, the falling cost of marine fuel in the first quarter of 2016, when it reached its lowest value since 2009, contributed significantly to lower production costs. This was maintained throughout 2016 and 2017 when fuel prices remained stable.



Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[37]

Trends on energy consumption for fleets operating in the Baltic Sea

This encouraging trend may be explained by several factors. Policy management instruments, specifically quota allocation (introduced in some countries), may have helped to improve the economic performance of certain fleets. Stocks of sprat, which is a commercially important species, and of Baltic herring in the central Baltic Sea and Gulf of Riga, are exploited at MSY level and harvested sustainably. From 2017, the average price of cod recovered. The economic indicators deteriorated in 2017 for the SSCF, but improved generally for LSF.

Challenges

Labour productivity (measured as gross value added/ full-time equivalents) is not following the same pace of improvement as in other sea basins. Although overall labour productivity has increased, this hides significant differences between the SSCF and the LSF (see figure below). The labour productivity of the SSCF does not show signs of improvement, and even decreased by 9% in 2017. For the LSF, the figure has been rather stable in recent years, although it increased over the period 2010-2017 and reached its highest level in 2017 (+2.3%), primarily due to Sweden (EUR 160 528), Denmark (EUR 92 715) and Finland (EUR 89 267). However, the productivity of the Swedish fleet partly depends on fisheries in the North Sea region, as the same fleet operates in both the Baltic and North Seas. Lower productivity levels were observed in Lithuania, Poland and Germany, varying from EUR 15 400 to EUR 30 000.

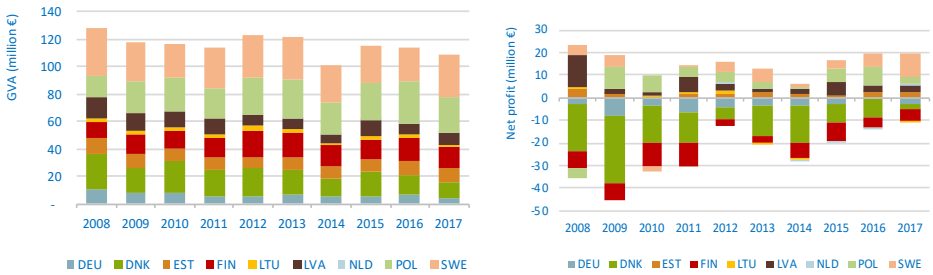
[37] Footnote 33 (p. 132).

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[38]

Trends on average labour productivity (GVA per FTE) by fishing activity for fleets operating in the Baltic Sea region

Reflecting the mixed tendencies in efforts, landings, fuel costs and labour productivity, the overall economic performance of the Baltic fleet shows a mixed picture and worrying situations in some cases, in contrast with other sea basins.

The revenue (income from landings and other income) of 2017 registered a modest increase of 1% compared to 2016 (EUR 226 million). Four Member States (Sweden, Poland, Finland and Denmark) accounted for 74% of all revenues. However, in 2017 GVA continued its downward trend for most of the Baltic fleets (a 2% decrease from 2016 to EUR 112 million, 12.6% decrease since the peak of EUR 128 million in 2008), except for Sweden and Latvia. The decrease was higher for the SSCF than for the LSF. Reflecting this situation, the GVA/revenue indicator deteriorated from 51 to 49 and was even lower for Germany, Lithuania and Poland (it increased for Sweden and remained almost unchanged for Estonia, Latvia and Denmark). The indicator deteriorated for the SSCF and improved for the LSF.



Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[39]

Trends on profits (GVA and net profit) for fleets operating in the Baltic Sea region

Although the Baltic fleet generated gross profits in 2017, four national fleets (Denmark, Finland, Germany and Lithuania) suffered net losses. Net profit was positive in 2017 (EUR 9.4 million) and has continued to improve since the record low of 2014, recording net profits in 2 consecutive years for the first time since 2008. This was mainly thanks to an extraordinarily high profit produced by the Swedish demersal trawler segment (DTS VL2440). The SSCF produced a high negative profit, in contrast to the LSF, which generated higher profit compared to 2016, while several Member States (Denmark, Germany and Lithuania) experienced net losses in 2017.

[38] Footnote 33 (p. 129).
[39] Footnote 33 (p. 134).

Overall the region's gross profit margin decreased from 23.5% in 2016 to 19.6% in 2017. However, it remains well above the gross profit margin observed in most of the years 2008-2014 (average of 17.4% for that period). The Swedish fleet was the most profitable (33% profit margin), followed by Estonia (30%), Finland (26%), Latvia (24%) and Poland (16%). While the Finnish fleet experienced positive gross profits, it was insufficient to cover capital costs. 30 of the 52 fleets operating in the Baltic Sea recorded gross profits in 2017, as did 19 of the 25 fleets operating solely in the Baltic Sea. 11 of the 25 fleet segments wholly dependent on the Baltic also generated a net profit.

Several factors may explain this economic performance. Prices of sprat have decreased following the Russian embargo and higher landings of low value species. The main stocks – eastern cod and Bothnian Sea herring – are at very low levels and have seen recent reductions in total allowable catches (TACs) (2019). Moreover, as of July 2019, the eastern cod fishery was completely closed except for unavoidable by-catches for some specific fleets. Ageing vessels, obsolete equipment and insufficient investment all lead to increased maintenance costs and reduce the fleet's profitability.

Some Member States are considerably dependent on the Baltic Sea. In terms of landings, the Estonian, Finnish, Latvian and Polish fisheries (excluding the distance waters fleets) are fully dependent on the Baltic Sea region. As more than 90% of the fleet is composed of small-scale vessels, this dependency makes the critical situation of the fish stocks and of the ecosystem event more challenging. Most German, Danish and Swedish vessels operate in both the Baltic and North Sea fishing regions. The consequences of Brexit are unknown, one can expect that it could have an impact on these fleets.

Share by fishing activity of fleets operating in the Baltic Sea, 2017

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[40]

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[41]

Importance of the Baltic Sea region for Member States' fisheries, 2017

4.2 Addressing overcapacity

[40] Footnote 33 (p. 128).
[41] Footnote 33 (p. 128).

Baltic Sea - Active fleet segments out of balance					
Member States	**Total number of active fleet segments**	**Number of fleet segments assesssed**	**% of total value of landings assessed**	**Number of assessed fleet segments out of balance**	**% of assessed fleet segments out of balance**
DK	19	14	91%	11	79%
EE	5	4	74%	4	100%
FI	8	2	21%	2	100%
DE	20	10	74%	10	100%
LV	3	3	100%	1	33%
LT	11	3	53%	3	100%
PL	18	2	55%	2	100%
SE	24	15	94%	9	60%
Region Total	**108**	**53**	**-**	**42**	**79%**
EU Total	602	255	42%	190	75%

Source: Assessment of balanced indicators and review of national reports on Member States' efforts to achieve balance between fleet capacity and fishing opportunities (STECF-19-13). Note: this table covers all Member States active in the region, although several segments are active outside the Baltic Sea. Assessment based on the sustainable harvest indicator.

Challenges

Fleet unbalance remains an issue for most of the active fleet segments assessed. According to a STECF assessment based on the sustainable harvest indicator, all assessed segments were out of balance in five Member States (EE, DE, FI, LT and PL).

Only Germany and Poland submitted action plans in 2019. The German action plan relates to five segments and specifically addresses the situation of part-time fishermen who do not fish for profit, but whose catches account for a very small portion of total catches and who are considered of importance to Germany's Baltic region.

The main general tools included in the German action plan provide for: (i) improving the accuracy of measures to adjust fishing capacity to fishing opportunities; (ii) modernisation of the German fishing fleet; (iii) actively shifting fishing pressure to maintain small-scale fisheries in the Baltic Sea; and (iv) temporary and permanent cessation of fishing activities.

Poland's action plan concerns the six segments, all operating in the Baltic Sea. For all these segments, the measure identified is temporary cessation.

Baltic Sea - Support to the permanent cessation under the EMFF						
Member State	**Number of vessels**	**Vessels - Share of EU total**	**Total eligible public cost committed**	**EMFF support committed**	**EMFF - Share of region's total**	**EMFF - Share of EU total**
LV	5	0,4%	1.367.637	683.819	9%	1%
PL	48	4%	12.854.548	6.427.274	87%	9%
DE	6	0,5%	542.462	271.231	4%	0%
Region Total	**59**	**5%**	**14.764.647**	**7.382.323**	**-**	**10%**
EU Total	1.260	-	148.925.930	75.256.543	-	-

Source: Commission Communication on the State of Play of the Common Fisheries Policy and Consultation on the Fishing Opportunities for 2020 (COM(2019 274 final).

Commission analysis shows that the fleet segments with the highest dependency on eastern Baltic cod account for more than 300 vessels, mainly trawlers and netters in Lithuania, Latvia and Poland, and, to a lesser extent, Denmark. Of these, only a minority seem resilient enough to survive a short-term – but not a medium or long-term – closure. The rest either suffer from an already poor situation that will be worsened by the closure or will see their profitability completely erode. These fleet segments are of significant socio-economic importance, representing between roughly 20% and 50% of the respective national fleet in Lithuania, Latvia and Poland, expressed in full-time equivalents. The vessels and fleet segments most heavily

impacted by the closure of the targeted eastern Baltic cod fishery will not all be able to redirect their fishing activities to other species, given the total closure of any directed fishery for eastern Baltic cod and the strong reductions agreed for other Baltic stocks by the Council on 14-15 October 2019. The closure will have a substantial impact on eastern Baltic cod fleets, with a strong negative impact in certain regions and coastal communities. Based on this, the Commission concluded that contingency measures[42] were necessary for the fisheries sector. These measures consist in introducing a capacity ceiling for Member States in the Baltic Sea whose fleets are affected by the adverse situation for eastern Baltic cod and a capacity exit regime for fleets formerly fishing on eastern Baltic cod.

4.3 Contributing to a fair standard of living for those who depend on fishing activities

Strengths

Over the recent years, wages have started to increase, from the minimum observed in 2014 where the average wage was EUR 8 314 per year for the SSCF and EUR 21 408 per year for the LSF. For the SSCF, the overall average wage per FTE increased by 11% in 2017 (around EUR 10 076 a year), following a trend for improvements since 2014. With regard to the LSF, wages have fluctuated since 2013, alongside fluctuations in fishing and economic results, but increased again in 2017 (+10% between 2016 and 2017; around EUR 23 527 a year).

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019).[43]

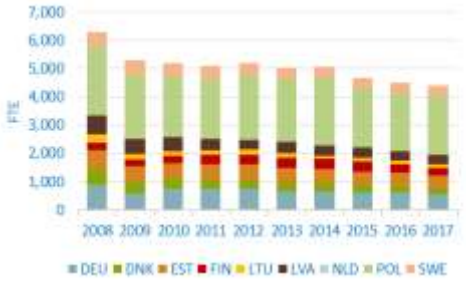
Trends on average wage by fishing activity for fleets operating in the Baltic Sea region

Challenges

In contrast with some other sea basins, employment in the fisheries sector, measured in terms of FTEs, shows a downward trend over the period 2008-2017, with the exception of a small increase in 2012. The trend continued in 2017 with a decrease of 2%. While the SSCF represents 92% of the number of vessels, total employment in this sector only amounts to 60% of the total number of FTEs (2 705 FTEs), reflecting the predominantly part-time nature of employment in this fleet segment.

[42] COM(2019) 564 final – Proposal for a Regulation amending Regulation (EU) 2016/1139, and Regulation (EU) No 508/2014.

[43] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 129).



Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[44]

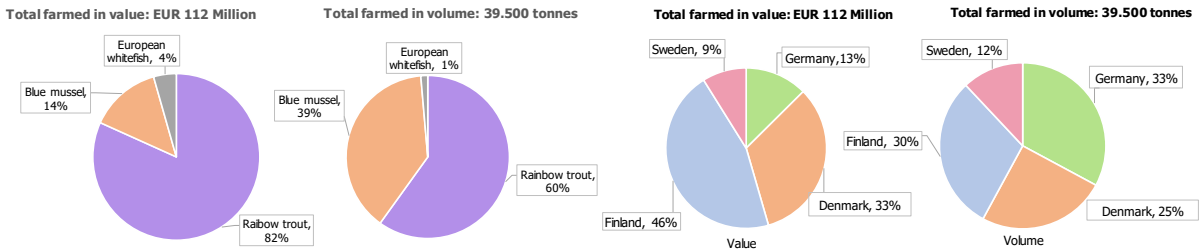
Employment trends in FTEs for fleets operating in the Baltic Sea

The Baltic small-scale coastal fleet is facing a difficult situation. It dominates the Baltic Sea fishing in terms of vessels (92%) and employment (77% of total employed and 60% of FTEs) but only accounts for 7% of the landed weight and 21% of the landed value. Its overall performance has been slowly deteriorating since 2010, with GVA at best stable or at times worsening. In 2017, the SSCF's revenue and GVA were lower than in 2016 (EUR 50.3 million compared to EUR 52.6 million in 2016 and EUR 23.8 million compared to 26.5 million respectively), while profitability deteriorated from a gross profit of EUR 1.7 million in 2016 to a gross loss of EUR 3.4 million in 2017.

Individual Member States face different situations. The German, Estonian, Finnish and Latvian small-scale coastal fleets made reasonable gross profits, while the others had either low profitability (Lithuania) or suffered losses. The Swedish, Danish and Finnish small-scale fleets have been suffering high net losses since 2008. This result was mainly caused by relatively high capital costs (mostly in the case of Finland), as well as high labour costs in the Swedish and Danish fleets (mostly in unpaid labour) compared to other countries. This can be explained by a higher contribution of less commercially active vessels in Denmark, Sweden and Finland than in other Baltic states. After taking account of estimated capital costs, only the Estonian SSCF fleet was making net profits in 2017.

5. Promoting a sustainable and profitable aquaculture[45]

The main species farmed in the Baltic are rainbow trout, blue mussel and European whitefish, with a high share of rainbow trout in volume and even more in value. The main producing Member States are Germany, Denmark and Finland, with Germany the main producer in volume and Finland in value.



Strengths

[44] Footnote 43 (p.131).

[45] Estonia, Lithuania, Latvia and Poland do not have marine aquaculture. See analysis of freshwater aquaculture in the chapter on Inland Areas.

In 2016[46], there were 7 100 FTEs working in the aquaculture sector in the Baltic Sea, representing 16.3% of the total for the EU.

Challenges

Among the main challenges to aquaculture in the region are the limited space available to expanding farming facilities and the existence of conflicts with other uses like marine tourism and sailing. Moreover, there are limitations to the possible expansion of existing forms of aquaculture linked to climatic conditions in Scandinavia and aquaculture is still not included in maritime spatial planning (MSP). Therefore, one of the priorities in the Baltic Sea remains to identify and map the most suitable areas for expansion of aquaculture and explore the potential of co-location opportunities among the various marine uses of the seas.

In terms of competitiveness, and due to higher prices, marine trout farming has an acceptable profitability in Denmark and has significantly increased in Finland. By contrast, the blue mussels sector in Denmark is struggling due to a fall in price. In Germany, blue mussels' producers can be seriously affected by the shortage of seed, the closing of fishing areas, storms, ocean dumping and the ongoing expansion of the Pacific oyster. There is therefore scope to support consolidation and adaptation of the blue mussel sector. Furthermore, given the concentration of regional production on two main species, it is worth looking into species diversification, both to adapt to climate change and to increase differentiation and competitiveness. This may take a range of forms (breeding of new species, algae aquaculture, including through offshore farming or recirculation systems, etc.) In this respect, the results of EU-funded research projects looking at the potential for farming new species could be taken into consideration.

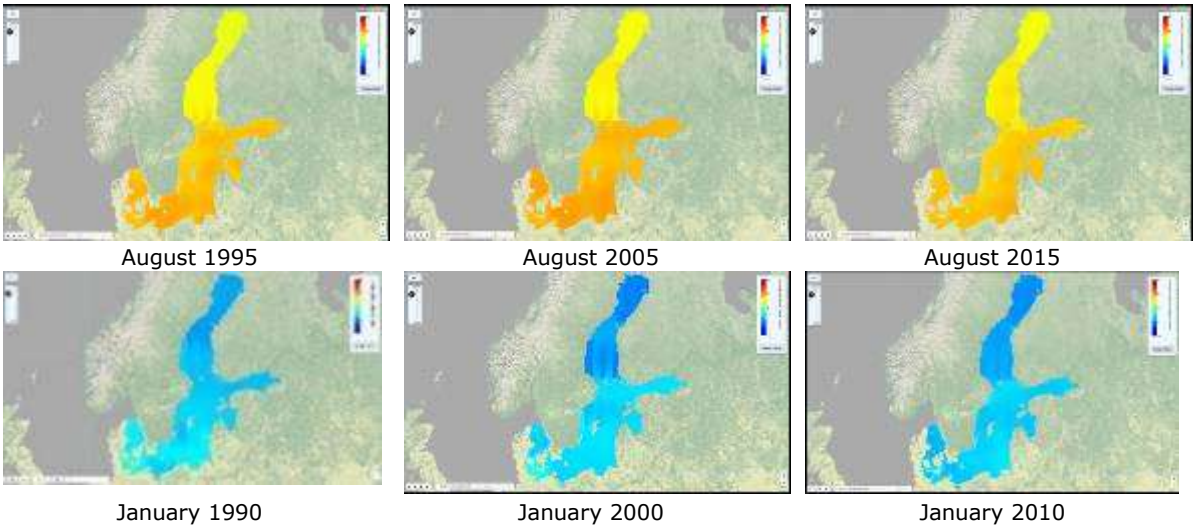
Environmental concerns have prevented the sector (notably marine aquaculture) from growing in recent decades and the sector has suffered from some image problems. Therefore, there is scope for action to increase the social acceptability of aquaculture. This requires not only informing the public about the environmental requirements EU farmers must comply with, but also establishing transparent environmental monitoring plans and reporting and collection of data on environmental indicators of aquaculture activities and taking measures to improve the environmental performance of aquaculture by, for example, using algae production to offset the nutrient footprint of fish farms. This would require attaching value to this type of aquaculture.

Communication between research and industry is also considered a point for improvement in the region.

As in other sea basins, administrative burden remains an obstacle for the sector's expansion. Producers have reported difficulties in complying with complex preconditions for the development of finfish and mussel aquaculture.

6. Enabling climate change adaptation and mitigation

[46] Available data do not allow for the presentation of a trend over a multi-year period.



Data source & visualisation: EMODnet physics portal

Average Sea Surface Temperature (SST) for months January and August (1990 to 2015) for the Baltic Sea (analysis of in situ data)

The slow but steady increase of Sea Surface Temperature (SST) in the Baltic Sea is an indicator of climate change. The effects of the changes in sea temperature, which besides the increase in the average SST is also visible in the form of extreme phenomena, will inevitably influence all aspects of Baltic coastal and marine social-ecological systems, including blue economy sectors and adaptation/mitigation strategies.

7. Fostering the local development of a sustainable blue economy

The Baltic blue economy is on a growing path. While coastal tourism is the main blue economy sector, a somewhat even distribution of activities can be observed. The relative importance of maritime transport in terms of GVA should also be highlighted.

Regional cooperation around the Baltic Sea is very developed. The EU Strategy for the Baltic Sea Region[47] has placed the preservation of the marine environment and the development of maritime sectors at the centre of its action plan. The action plan, in turn, identifies a series of priority actions. The plan includes a policy area on bioeconomy that covers fisheries and aquaculture. Furthermore, the Sustainable Blue Growth Agenda for the Baltic Sea Region[48], adopted by the European Commission in 2014 highlighted the extraordinary potential for developing the maritime economy in the Baltic Sea region. The Commission's Directorate-General for Maritime Affairs and Fisheries also published a report in 2017 entitled *Towards an implementation strategy for the Sustainable Blue Growth Agenda for the Baltic Sea Region*, which presents the results of a systematic stakeholder dialogue in the region to identify and

[47] The European Union Strategy for the Baltic Sea Region (EUSBSR) was the first macro-regional strategy in Europe. The Strategy was approved by the European Council in 2009 following a communication from the European Commission. It is divided into three objectives, which represent the three key challenges: saving the sea, connecting the region and increasing prosperity. Each objective relates to a wide range of policies and has an impact on the other objectives, which can be found at: https://www.balticsea-region-strategy.eu/

[48] https://ec.europa.eu/maritimeaffairs/content/delivering-sustainable-blue-growth-agenda-baltic-sea-region_en

discuss in greater depth the processes necessary to realise the Baltic blue growth agenda in the coming years.

Against this backdrop, the Baltic region can build on the experience of Community-Led Local Development (CLLD**)** to foster the sustainable development of the blue economy at local level.

Between 2014 and 2020, there are 110 Fisheries Local Action Groups (FLAGs) active in the Baltic Sea area, covering on average 4 094 km² (well above the 2 277 km² average in all sea basins) and a population of 102 716 people. The fisheries sector employs on average 301 workers in each FLAG area, 49% in the processing sector and 32% in the catching sector; aquaculture represents 19% of employment.

Receiving on average an EMFF contribution of EUR 1 245 175 during the 2014-2020 EMFF programming period, these FLAGs have a typical total budget of EUR 1 649 333, slightly lower than the average for all sea basins (although there are significant differences between Member States). As with most FLAGs, their strategies are focused on adding value to local catches and on diversification outside the fisheries sector. Despite the environmental issues in the Baltic Sea, environment- and governance-related projects seem to have a lower priority than for the rest of the FLAGs (except for Sweden).

At local level, challenges in the Baltic Sea include:

- the decline of commercial fisheries, especially the SSCF;
- an ageing population – including in the fisheries sector – and depopulation of remote coastal areas and islands;
- marine environmental problems such as marine pollution, eutrophication of this quasi-closed sea and coastal erosion;
- usage conflicts between fishermen and predatory protected species such as seals and cormorants;
- a lower fish consumption per inhabitant than the European average;
- underdeveloped tourism infrastructure.

Opportunities for FLAGs could include:

- consolidating cooperation between fisheries-dependent communities to ensure a basin-wide approach to the blue economy and environmental challenges;
- supporting action in favour of the environment;
- promoting the consumption and processing of local seafood;
- increasing the social acceptability of aquaculture;
- developing tourism in relation to fishing;
- action to support the entry of younger fishers into the sector and aquaculture production attracting young people and skilled youth;
- projects to develop coastal tourism in order to benefit from the opportunities created by climate change;
- promoting blue biotechnology as an alternative and innovative sector.

Many of the Baltic FLAGs are multi-funded or have close links with LEADER Local Action Groups (LAGs). This may be an opportunity to strengthen the linkages between fisheries and aquaculture and other sectors of the local economy. FLAG cooperation at sea basin level can

also address broader issues such as the creation of infrastructure to mitigate the impact of climate change.

NORTH SEA

1. Scope

The North Sea and Eastern Arctic sea basin comprises ICES areas 1, 2, 3a, 4 and 7d. The main Member States operating in this sea basin are Belgium, Denmark, France, the Netherlands, Germany and Sweden. Ireland, Lithuania, Portugal and Spain also have some fleet segments active in the basin.

The greater North Sea ecoregion includes the North Sea, the English Channel, Skagerrak and Kattegat. It is a temperate coastal shelf sea with a deep channel in the northwest, a permanently thermally mixed water column in the south and east, and seasonal stratification in the north. It consists of four main areas.

- The northern North Sea (depths 0–500 m) is strongly influenced by oceanic inflow and has a deep channel in the east. The majority of the area is stratified in summer. The dominant human activities are fishing and oil and gas production.
- The southern North Sea (depths 0–50 m) is characterised by large river inputs and strongly mixed water. The dominant human activities are fishing, tourism, shipping, ports, gas production, wind farms, and aggregate (sand) extraction.
- The Skagerrak and Kattegat form the link to the Baltic Sea and are less saline and less tidal than the rest of the ecoregion. The water column is usually mixed. The dominant human activities are fishing, shipping and wind farms.

- The English Channel joins the southern North Sea to the Atlantic. It is usually mixed and heavily influenced by wind events. The dominant human activities are fishing, tourism, shipping and aggregate (gravel) extraction.

2. Ensuring sustainable management of natural resources

The main Member States operating fleets in the North Sea are Belgium, Denmark, Germany, France, the Netherlands and Sweden. They target high value species including common sole (Netherlands, Belgium, Germany and France), common shrimp (Netherlands, Germany, Denmark and Belgium) and Norway lobster (Denmark, Netherlands, Germany, Sweden and to some extent Belgium). Other important demersal species include Atlantic cod (Denmark, Germany and Netherlands) and European plaice (Netherlands, Denmark and Belgium). A number of these Member States also target pelagic species such as Atlantic mackerel and Atlantic herring (Denmark, the Netherlands, Germany and Sweden). The largest fleets in terms of the value of landings of these main species are the Danish, Dutch and French fleets. The most important species for fleets operating in the sea basin in terms of value include Atlantic herring (12.5%), Atlantic mackerel (10%), Atlantic cod (10%), common shrimp (10%), common sole (8%) and European plaice (7.5%). Spain, Portugal, France and Germany also fish for cod, haddock and saithe in the northeast Arctic under agreements with Norway and elsewhere.

2.1 Applying the precautionary approach and achieving maximum sustainable yields

Status of stocks in the North Sea (source: STECF report 'Monitoring the performance of the CFP', STECF-Adhoc-19-01)

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of stocks for which fishing mortality (F) exceeded F_{MSY}.														
13	16	17	19	17	17	13	12	11	12	12	13	11	8	8
Number of stocks outside safe biological limits														
5	5	8	8	7	6	5	5	6	4	3	5	5	4	3
SSB relative to 2003														
1.00	0.82	0.79	0.71	0.72	0.87	0.90	1.03	1.31	1.04	1.02	1.09	1.13	1.30	1.20

Strengths

Most North Sea stocks are currently managed sustainably, with 18 out of 26 TACs set in line with the MSY in 2019. The figure rises to 100% for TACs managed by the EU alone: all these 11 TACs are set at MSY level. Among the key stocks relevant for the North Sea fishery that are now fished at sustainable levels are sole, plaice, haddock and saithe. Data collected in 2017 indicate that 13 stocks in the greater North Sea were fished at or within sustainable rates and 8 stocks were fished above this rate[49].

The predictable and sustainable management of the North Sea stocks will be further facilitated by the implementation of the new North Sea multiannual management plan, which covers about 70% of North Sea stocks. This multiannual plan introduces additional biomass safeguards that are not provided for in the CFP Regulation. The plan establishes targets expressed in F*msy* ranges for a wide range of stocks: North Sea cod, haddock, North Sea plaice, saithe, North Sea sole, Kattegat sole, North Sea whiting, anglerfish, northern prawn and Norway lobster. The plan aims to ensure that the exploitation of living marine biological resources maintains and restores populations of harvested species above levels that can produce MSY. At the same time,

[49] Scientific, Technical and Economic Committee for Fisheries (STECF) – Monitoring the performance of the Common Fisheries Policy (STECF-Adhoc-19-01).

it introduces a certain level of flexibility in the sustainable management of the stocks via the MSY ranges concept.

Challenges

There are 15 TACs that are not yet set in line with the MSY and remain to be managed at sustainable levels. These 15 TACs are not decided solely by the EU but set together with Norway or other coastal states. Their level therefore depends on the agreements reached between the EU and its international partners.

2.2 Implementing the ecosystem-based approach to fisheries management

Strengths

Scientific knowledge of the structure and functioning of the ecosystems is steadily improving and recently ICES started providing ecosystem overviews and Integrated Ecosystem Assessments. They highlight an overall stable system, with some key drivers influencing ecosystems: fishing, oil and gas activities, transportation, wind farms, ports and aggregate sand extraction, etc. This assessment indicates that most stocks are fished at rates at or below F*msy***,** with a decreasing mortality and an increasing biomass. ICES also provides an overview of the multi-species interactions that is allowing for more targeted management measures. This additional scientific background is used to further inform the fisheries management decisions relevant for this sea basin.

In addition, this scientific background could be used in the development of Maritime Spatial Planning initiatives, which would allow for a more balanced exploitation of the ecosystem by the various human activities.

Challenges

While the availability of additional advice is clearly beneficial, there is a continued need to further operationalise the ecosystem approach in fisheries management decisions. For example, information on by-catches of protected species is incomplete and is little used in proactive management. Information on sensitive habitats is only slowly being taken up by Member States when considering the implementation of Natura 2000 areas. Studies by ICES on benthic habitats show that demersal trawling, which is the main fishing method used in the North Sea, causes widespread disturbance. While static nets have a negative impact on harbour porpoise and seabird populations and longlines also cause seabird mortality, there is potential for widening the use of low-impact fishing methods and for further improving current fishing methods.

Research, analysis and development of ecosystem management parameters and targets are currently under way under the Marine Strategy Framework Directive. The implementation of this Directive will require substantial effort on research, consultation and extension work, the development of lower-impact fishing gears and the consideration of additional marine protected areas.

2.3 Eliminating discards and making the best use of unwanted catches

Strengths

The landing obligation is more difficult to implement in mixed fisheries such as the demersal fisheries of the North Sea. In general, however, no obvious economic impact has been observed since the gradual phasing in of the landing obligation in 2015-2016. Some positive impact from the landing obligation can be seen on the ground. Fishers have taken up more selective fishing gears, for instance the ‘Flemish panel’, which reduces unwanted catches by the sole-targeting

beam trawl fleet. Knowledge on survivability and selectivity has increased thanks to studies launched by Member States in the context of discard-related exemption requests.

Challenges

The elimination of discards in demersal (mixed) fisheries is challenging. Fishers fear that the landing obligation will have an impact on their profitability, mainly due to increased handling and storage costs. Improvements in selectivity are necessary to reduce discards. Studies on fish survival after discarding are needed to scientifically underpin the limited exemptions allowed from the landing obligation, notably on species such as plaice, skates and rays. More investment in control and enforcement is also necessary (see below).

As all fish caught must be landed, fishers may have to stop fishing their main species once the quotas are reached for some by-catch species, even if the quotas for the main spaces are not yet reached (this is called the 'choke effect'). Although no clear choke situation has been reported, potential choke species are a concern, particularly in mixed fisheries. To continue fishing throughout the year, it will be vital to have effective quota management or exchange in place or to adapt fishing strategies to avoid certain species.

Finding the right market outlets for unwanted catches and the handling of these catches remains a difficulty. Certain stakeholders from the sector argue that the business case for creating new outlets for these catches is weak as more selective fishing should reduce their volume dramatically.

2.4 Ensuring coherence with environmental legislation

Strengths

The greater North Sea region, which includes the North Sea basin, scores the best as far as coverage of Marine Protected Areas (MPAs) is concerned. It has therefore actively contributed to the OSPAR objectives of achieving a functioning MPAs network in the Northeast Atlantic. In 2017, 18% of the region was covered by MPAs[50].

Joint recommendations developed by the Member States under Article 11 of the CFP on conservation measures inside the existing MPAs have taken a long time to develop and only cover certain areas in the North Sea. However, there seems to be momentum in their development. This should further allow recovery and improvement of the state of stocks in the North Sea.

Challenges

The key challenge remains that for a number of MPAs, fisheries management measures are still pending. OSPAR also indicates that the ecological coherence of the MPAs network cannot be achieved without: (i) better knowledge and better relevant data e.g. on the occurrence, distribution and status of species and habitats; and (ii) a common understanding about what constitutes effective management.

Under the Technical Measures Regulation[51], measures should be implemented to ensure that incidental catches of sensitive species are minimised and where possible eliminated. In the North Sea, OSPAR has identified several species of seabirds as being in low conservation status, but knowledge about the state of these populations is generally poor. Member States are

[50] www.ospar.org/site/assets/files/1378/assessment_sheet_mpa_status_2017.pdf

[51] Regulation (EU) 2019/1241, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.

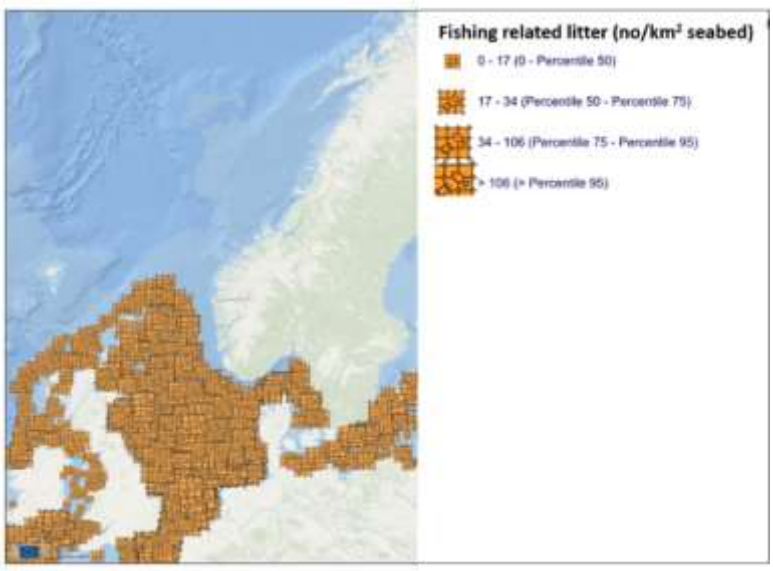
also required to implement protection for sensitive habitats, including vulnerable marine ecosystems. Support will be needed to develop the necessary scientific underpinning to comply with this requirement. Overall, there is a significant need to improve the protection of these species. This will require investment in existing and new approaches to monitoring and mitigation of by-catches.

The available data on marine litter (beach and seabed) show that intense monitoring and collection efforts are taking place; these demonstrate the severity of the problem in the area. It is no surprise that the majority of beach litter identified in the North Sea is made of artificial polymer materials (most plastics). The monitoring and collection efforts showcase the severity of the problem of marine litter on the seabed, especially those originating from fisheries and other human activities[52]. The density of fisheries- and plastic bag-related litter is surely affecting the seabed communities of the sea basin, while the trawling efforts required to remove the litter from the seabed can also negatively affect seabed ecology.

While Member States' interest in using EU support to involve the fishing industry in reducing marine litter has drastically increased, a lack of evaluation indicators has resulted in a lack of tools to evaluate the effectiveness and efficiency of marine litter-related action.

Preventing the entrance of new marine litter in North Sea waters should be prioritised, while monitoring and collection efforts should continue if the problem is to be effectively tackled. Regarding beach litter monitoring, Member States should aim to ensure that monitoring and collection efforts cover their whole coastline.

Very scarce information is available for the parts of the North Sea in the proximity of Norway and Iceland. Regional cooperation efforts enabling the inflow of relevant data would be welcome and allow for more robust analysis of the overall situation in the North Sea.



Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas.

Density of fishing-related seabed litter (number of items per km²) in the North Sea per trawl, per year, obtained during monitoring serveys (data availability: 2007-2018)

[52] OSPAR estimates that 93% of North Sea fulmars have plastic in their stomachs (https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/key-messages-and-highlights/marine-litter/).

Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas.

Density of plastic bag-related seabed litter (number of items per km²) in the North Sea per trawl, per year, obtained during monitoring serveys (data availability: 2007-2018)

3. Improving enforcement and control of fisheries and the provision of data

3.1 Collection of scientific data

Strengths

Data collection is well established for the North Sea basin. All Member States concerned have had an institutionalised operational data collection management system in place for more than a decade. The collection of both fisheries-dependent data and fisheries-independent data covers all the relevant areas Member States need to report on. Despite some reported problems (e.g. shortage of observer programme coverage) Member States in the North Sea basin have fully carried out data collection activities during the 2014-2020 EMFF period and have responded to data calls from scientific end users.

The ICES Regional Database (RDB) is a strong tool in support of data collection evaluation for both the Regional Coordination Groups (RCGs) on data collection organised per sea basin at EU level and for ICES as end user. End users generally report few final data transmission issues because data are collected and provided correctly following a data call and because issues are discussed and clarified with Member States before being reported to the Commission. Therefore, reported data transmission issues are often spotted during data preparation for scientific stock assessment and come out of the clarification process between the end user and Member State. The Commission, together with STECF, carries out evaluation of reported data issues and takes action based on the results of this evaluation.

Within the region, cooperation among Member States is mainly driven by the North Sea and Eastern Arctic RCGs that merged with the RCG North Atlantic and counts 14 Member States[53]. Although the RCG Baltic maintains independent meetings, common terms of reference and a common tasks plan for the next 3 years were drawn up in 2019. It includes the three RCGs

[53] BE, DK, EE, FI, FR, DE, IE, LV, LI, NL, PT, PL, ES, SE.

North Atlantic and North Sea and Eastern Arctic, which became NANSEA, and the Baltic. In this context, Member States coordinate in fields including: (i) updating of data collection requirements; (ii) joint data collection methodologies and approaches to respond to data calls (enhancing consistency); (iii) strong cooperation on scientific surveys by dedicated vessels; (iv) improved quality checks by Member States before uploading data; and (v) regional database use.

Challenges

Sampling methods need to be further improved to live up to the ambition of the 2017 EU Data Collection Regulation[54], in particular for discards, unwanted catches, incidental by-catches of listed prohibited and sensitive species by commercial fisheries, and for data collection based on pilot studies planned under the current EU-MAP on recreational and small-scale fisheries. The MARE/2016/22 fishPi2 study (commissioned for the whole of the Atlantic EU waters including the North Sea) has identified and proposed such sampling programmes. They need to be discussed among Member States, and implemented and regionally coordinated in the near future. Similarly, positive experiences from pilot studies developed by individual Member States in the above-mentioned fields also need to be integrated into mainstream data collection activities, in particular under a new EU-MAP for data collection.

Member States upload data to the RDB regional database, hosted and maintained by ICES. Scientists, including ICES staff, are developing a new database called RDBES (Regional Data Base and Estimation Sampling). This is a promising tool that will improve the quality of the data used in the scientific advisory process and will facilitate Member States' submission of annual reports to the Commission. However, the change to another database may also involve changes in the Member States' sampling methodology. This is a challenge to address regionally.

New obligations on data collection for sensitive species have been introduced in the Technical Measures Regulation[55], which requires Member States to take the necessary steps to collect scientific data on incidental catches of sensitive species. Advice on sampling of by-catches of cetaceans has been provided by the STECF[56] and advice on sampling of all sensitive species is also available from ICES. Compliance with this requirement involves increased efforts on data collection, observer coverage and on-board electronic monitoring.

Continued challenges in the field of data collection are:

- further coordinated improvement of quality checks (including relations with the RDB in ICES);
- training of national data collection staff;
- work on stakeholder buy-in (notably buy-in from fishers as regards filling out logbooks in a reliable manner);
- increasing coverage of observer trips.

Regional cooperation in the context of the RCG remains a challenge.

[54] Regulation (EU) 1004/2017.

[55] Regulation (EU) 2019/1241, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.

[56] Scientific, Technical and Economic Committee for Fisheries (STECF) – Review of the implementation of the EU regulation on the incidental catches of cetaceans (STECF-19-07).

3.2 Enforcement and control

Strengths

In the North Sea, most Member States are adequately equipped with patrol vessels, surveillance aircraft, electronic recording and reporting systems, fishing monitoring centres and other traditional control means. In addition, regional cooperation helps ensuring a level playing field for control, both within and outside the EU. The main cooperation tool in the North Sea is the Joint Deployment Plans (JDP) coordinated by EFCA, based upon Specific Control and Inspection Programmes (SCIP)[57]. The steering groups of these JDPs meet regularly to perform a regional risk assessment, plan regional inspection programmes, assess results and undertake pilot projects.

Challenges

The main challenge in the coming years – like in the other sea basins – is the implementation, control and enforcement of the landing obligation. Also, more needs to be done to further improve the reliability of catch data, including data on discards. Among other things, this requires improved and innovative monitoring technologies and better systems and procedures for weighing of landings. In addition, the exchange of fisheries and control data between Member States can be improved. There is also room to strengthen the control and monitoring of the small-scale fleet. New reporting and monitoring technology can help improve the situation. Furthermore, more needs to be done to carry out effective controls of engine power, either by carrying out physical verifications and/or by use of modern technologies such as the installation of devices allowing continuous monitoring of engine power. Finally, there must be better control of sales channels and traceability of fish, including of the transport phase.

4. Ensuring a balanced socio-economic outlook for the fisheries sector

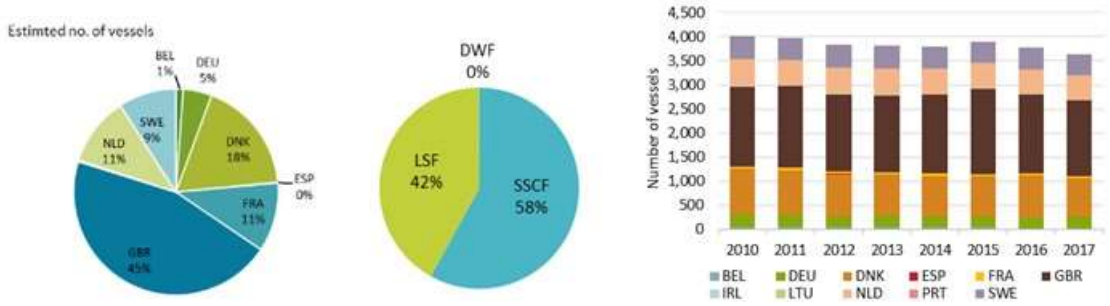
The number of vessels operating in the North Sea and Eastern Arctic followed a downward trend between 2010 and 2016, with an increase in 2015, mainly due to more UK vessels. In 2016, the fleet totalled 4 835 vessels.

In 2016, 9 Member States operated important large-scale fleets, which comprised 2 024 active vessels. The UK, the Netherlands, Denmark, and France had the largest number of active vessels with 599, 342, 337 and 295 vessels respectively. Small-scale coastal fisheries represented 58% of the region's vessels and around 40% of the days at sea. Seven Member States operated small-scale coastal fleets (SSCFs) but three Member States – the UK, France and Denmark – accounted for 88% of this effort, of which the UK fleet, consisting of 1 594 vessels and employing 1 038 FTEs, generated the highest revenue (EUR 68.7 million) and net profit (EUR 8.1 million). The most important fleet segments in terms of income from landings were the UK pots and trap vessels under 10 metres (EUR 36.6 million) and French drift netters of 10-12 meters (EUR 17.7 million).

Trends on number of vessels for fleets operating in the North Sea & Eastern Arctic region
Data source: MS data submissions under the 2019

[57] JDP North Sea-EFCA decision 2018/3257 and JDP Western Waters EFCA 2018/33. The North Sea Steering Group composition: Member States (BE, DK, DE, FR, IE, NL, SE, UK) DG MARE and EFCA. Composition of the pelagic Western Waters Steering Group: Member States (BE, DK, DE, EE, ES, FR, IE, LT, LV, NL, PL, PT, UK) DG MARE and EFCA.

Fleet Economic data call (MARE/A3/AC(2019)).[58]



Data source: Member State data submissions under the DCF 2018 Fleet Economic (MARE/A3/AC(2018)).[59]

Share of North Sea & Eastern Arctic fleet capacity by Member State and fishing activity, 2016

4.1 Providing conditions for an economically viable and competitive fishing sector

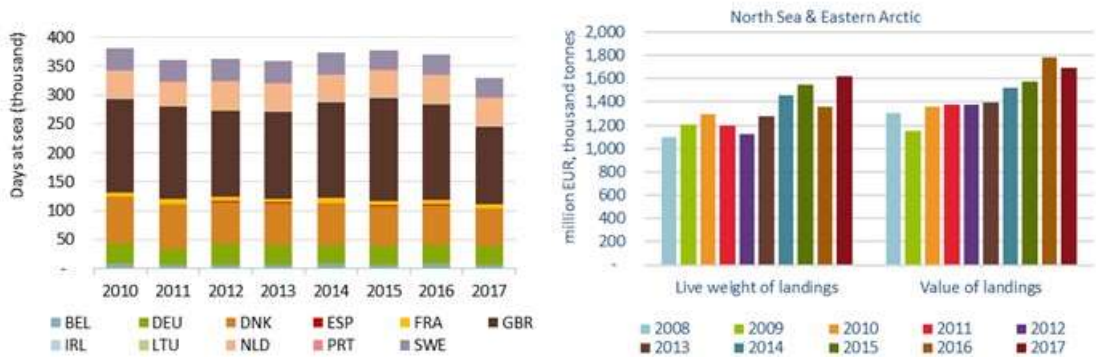
Strengths

Fishing effort has generally decreased, more or less following the reduction in fleet capacity, with an increase in 2014 and 2015 largely attributed to the UK fleet. Large-scale fisheries (LSF) accounted for 60% of the days at sea, of which most were undertaken by the demersal fleet.

Conversely, the value of landings increased by 28% between 2010 and 2016. For a number of important North Sea fish species, prices were higher, while landings in weight were lower. Fuel prices were relatively low. With fuel being an important operational cost, this was an important driver for higher revenues in 2016.

Trends in landings for fleets operating in the North Sea & Eastern Arctic fishing regions

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[60]



Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[61]

[58] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 100).

[59] Scientific, Technical and Economic Committee for Fisheries (STECF) – The 2018 Annual Economic Report on the EU Fishing Fleet (STECF-18-07). Publications Office of the European Union, Luxembourg, 2018, JRC112940, ISBN 978-92-79-79390-5, doi: 10.2760/56158 (p. 110).

[60] Footnote 58 (p. 98).

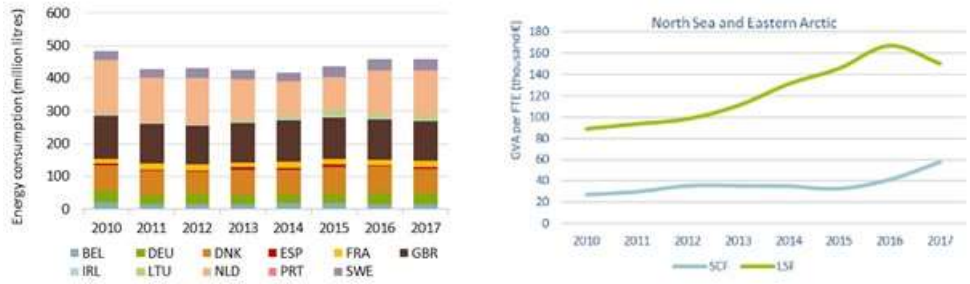
[61] Footnote 58 (p. 101).

**Trends on fishing effort (in days at sea)
for fleets operating in the North Sea & Eastern Arctic region**

Fuel consumption decreased significantly between 2010 and 2014 but has tended to increase again since then, in line with the increased number of vessels. The ratio of fuel cost versus revenue has fallen in recent years, thanks in part to innovations in new and lighter fishing gears (to reduce consumption) together with decreased fuel prices and higher fish prices for the most important target species.

Labour productivity (GVA/FTE) has consistently increased since 2010, albeit differently depending on the fleet segment. It considerably improved in the large-scale fleet (+84% between 2010 and 2014), coinciding with a decrease in employment, which has receded since 2014 and slowed down the productivity increase. For the SSCF, labour productivity increased more slowly and less dramatically (+35%).

**Trends on and fuel consumption for Member State fleets
operating in the North Sea & Eastern Arctic region**
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[62]



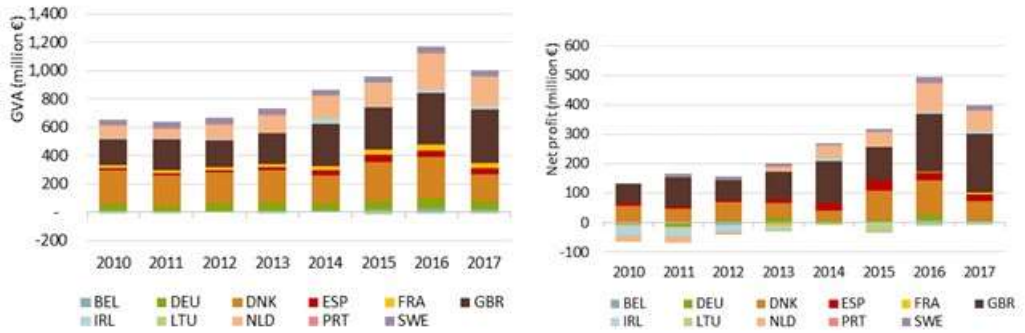
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[63]

**Trends on labour productivity (GVA per FTE) for Member State fleets
operating in the North Sea & Eastern Arctic region**

Reflecting the positive trends above, the overall performance of fleets operating in the North Sea and Eastern Arctic has been positive in the recent years and improved further compared to previous years. All performance indicators followed an upward trend from 2010 to 2016: gross value added +24%, gross profit +32%, net profit up 66%. The revenue (income from landings and other income) generated in 2016 was estimated at almost EUR 2.1 billion, up 12% on 2015. GVA was estimated at over EUR 1.3 billion, an overall increase of 24% on 2015. After accounting for all operating costs, the fleets operating in the region made almost EUR 713 million in gross profit, an estimated 32% increase on 2015.

Most fleets operating in the region generated net profits, and overall both the small-scale coastal fleets and large-scale fleets were profitable in 2016. All national large-scale fleets generated positive results in 2016, achieving EUR 1.24 billion in GVA and EUR 691 million in gross profit. Denmark generated EUR 183 million GVA and EUR 114 million net profit, followed by the Netherlands (EUR 126 million and EUR 101 million).

[62] Footnote 58 (p. 101).
[63] Footnote 58 (p. 99).



Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015).[64]

Trends in profit (GVA and net profit) for fleets operating in the North Sea & Eastern Arctic region

Challenges

This positive situation should be an incentive to secure the structural conditions for future profitability, in particular as regards reducing operational and energy costs, investing in human capital and achieving deeper integration of fisheries in the local maritime economies.

However, the fleets of some Member States are considerably dependent on the North Sea & Eastern Arctic region. In terms of value of landings, the fleets from the Netherlands (91%), Denmark (86%), Belgium (75%), Germany (71%) and Sweden (62%) are particularly dependent. When looking at landed weight, the situation does not differ significantly: vessels from Denmark caught 83% of their landings in the North Sea & Eastern Arctic, followed by vessels from Belgium (79%), the Netherlands (71%) and Germany (55%). SSCFs constitute around 60% of the vessels operating on the North Sea and the value of the landings of most of this segment depends for more than 50% on one or two main species. The large-scale fleet makes more than 90% of the value of landings, revenue, GVA and gross profit in the North Sea.

Therefore, while the consequences of Brexit are unknown, one can expect that it could have a large impact on the North Sea. Belgium, the Netherlands, Germany, Denmark, France, Sweden and, to a lesser extent, Spain and Ireland are expected to be affected. The uncertainty created by the potential consequences of Brexit, combined with issues faced by fisheries in general, are likely to put pressure on the sector and will require an appropriate response.

Share of North Sea & Eastern Arctic fleet by fishing activity, 2017

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[65]

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[66]

Importance of the North Sea & Eastern Arctic regions for Member States' fisheries, 2017

[64] Footnote 58 (p. 103).
[65] Footnote 58 (p. 98).
[66] Footnote 58 (p. 97).

4.2 Addressing overcapacity

North Sea - Active fleet segments out of balance					
Member States	Total number of active fleet segments	Number of fleet segments assesssed	% of total value of landings assessed	Number of assessed fleet segments out of balance	% of assessed fleet segments out of balance
BE	9	2	85%	1	50%
DK	19	14	91%	11	79%
NL	25	6	68%	5	83%
UK	44	19	77%	7	37%
Region Total	**97**	**41**	-	**24**	**59%**
EU Total	602	255	-	190	75%

Source: Assessment of balanced indicators and review of national reports on Member States' efforts to achieve balance between fleet capacity and fishing opportunities (STECF-19-13). Note: this table covers all segments fishing in FAO 27 of the countries listed above. Assessment based on the sustainable harvest indicator. The balance situation for other countries fishing in the North Sea is covered in the analysis for the Baltic (Denmark and Sweden) or Western Waters (France and Spain).

Challenges

Fleet unbalance remains an issue for several active fleet segments assessed. According to a STECF assessment based on the sustainable harvest indicator, 59% of the region's assessed fleet segments are unbalanced, with a high share for the Netherlands (83%) and Denmark (79%).

Nevertheless, Belgium, Denmark and the Netherlands declare that their fleets are to be considered to be in balance.

4.3 Contributing to a fair standard of living for those who depend on fishing activities

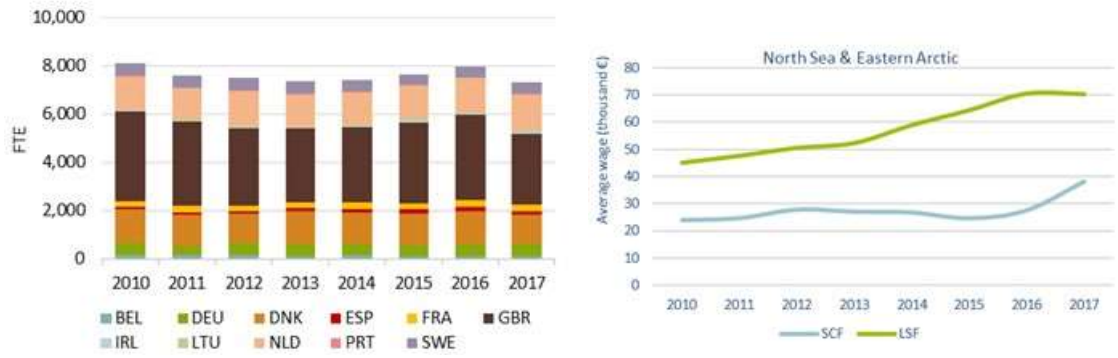
Strengths

It seems that the overall declining trend in employment in fisheries has halted. After several years during which employment measured in terms of full-time equivalents (FTEs) posted a downward trend (-4% between 2010 and 2016), 2016 saw an increase compared to 2015 (+5%). The main contribution to this increase came from Denmark and the Netherlands (FTEs up by 4% and 7% respectively in 2016 compared to 2015), with large-scale fisheries mainly accounting for the increase. The LSF generated 7 810 jobs (7 704 FTEs), mostly full-time, while the SSCF generated 3 976 jobs but only 1 642 FTEs, an indication that these are mostly part-time jobs.

Improvements in overall profitability translated into improvements in wages, although in a differentiated away depending on fleet segment. Between 2010 and 2016, wages per FTE in the large-scale fleet increased by 55%, with a 10% increase between 2015 and 2016. In 2016, the average yearly wage in the LSF was estimated at EUR 71 600. In the SSCF, the trend was less clear, but there was an overall increase of 12% between 2010 and 2016, with a 5% increase between 2015 and 2016. The average yearly wage in the SSCF between 2010 and 2016 was around EUR 33 000.

Trends on average wage per FTE by fishing activity for fleets operating in the North Sea & Eastern Arctic region
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[67]

[67] Footnote 58 (p. 99).



Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)).[68]

Trends in employment (in FTEs) for fleets operating in the North Sea & Eastern Arctic region

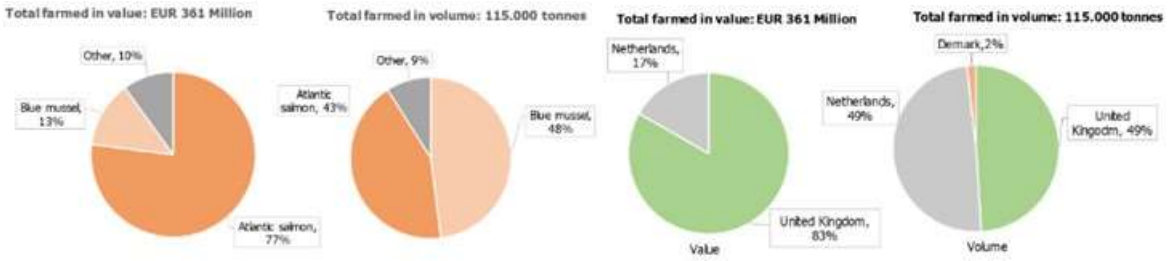
Challenges

Small-scale fisheries of the North Sea region face a particular situation. On the one hand, the SSCF segment was profitable overall in 2016, generating EUR 81.3 million in GVA, EUR 27.1 million in gross profit and EUR 15.6 million net profit, with a net profit margin of 11.2%. However, in two Member States (Germany and Ireland) the SSCF suffered net losses.

On the other hand, when it comes to employment, the overall improvements are predominantly driven by the large-scale fleet. By comparison, the small-scale fleet is not growing at the same pace. FTEs in the SSCF are much lower than in the large-scale fleet and have remained relatively stable over time. Moreover, in all Member States a large majority of those employed in the SSCF are part-time or occasional workers. Total employment for the SSCF is highest for France, totalling 483 and reflecting the number of active vessels in this Member State.

5. Promoting sustainable and profitable aquaculture

While main aquaculture production in the North Sea takes place in the UK, for the purpose of this analysis only production outside the UK is considered. As a consequence, the Netherlands results the biggest aquaculture producer in the region (EU-27), with a production highly concentrated on one main species: Blue Mussel. Another important species is oysters (Netherlands).



Strengths

In 2016[69], it was estimated that 3 700 FTEs were employed in aquaculture in the North Sea (UK included), representing 8.4% of employment in aquaculture in the EU. They generated a total of EUR 265 million of GVA.

[68] Footnote 58 (p. 100).
[69] It is not possible to present a trend over a multi-year period using the current available data.

Challenges

The main challenge for the growth of aquaculture in the North Sea is the limited space available at sea for expanding farming sites. In the Netherlands and Belgium, several research projects are starting to explore the possibilities for developing aquaculture further offshore and in windmill parks (algae, finfish, crustaceans and shellfish). However, this faces several difficulties including rough conditions, multiple use of space and nutrition problems. Therefore, one of the priorities remains the identification and mapping of the most suitable areas for expansion of aquaculture.

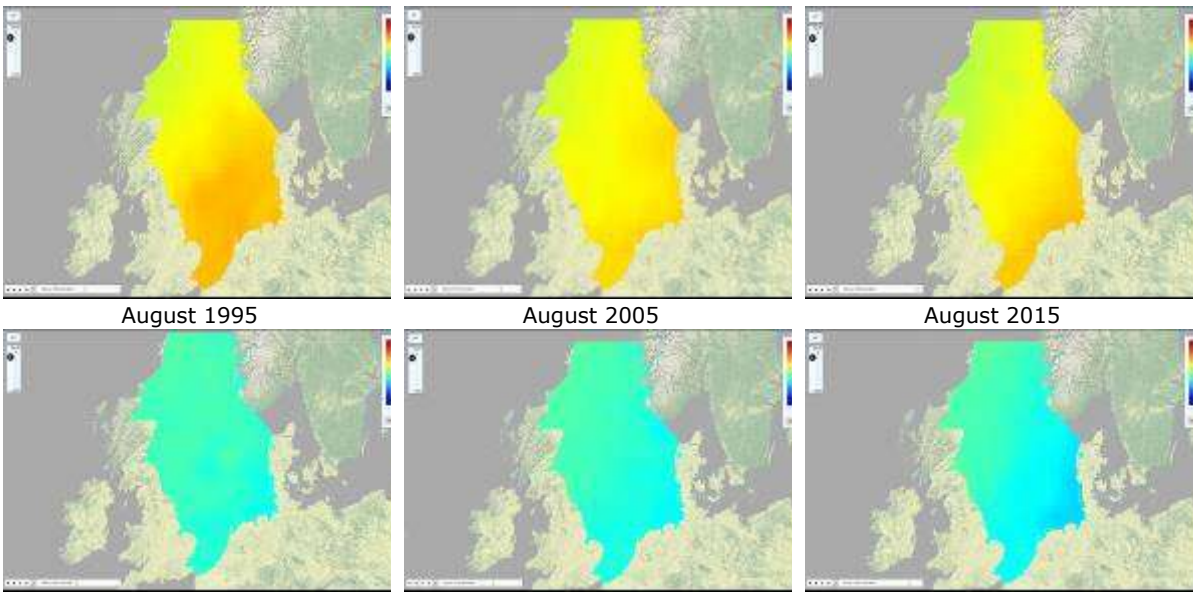
While mussels farming is a profitable business, the sea trout segment is struggling in some Member States, even operating around break-even level. In addition, the region is very dependent on a limited number of species. Therefore, adding value and optimising the use of existing installations would ensure the sustainability of the current segments. In addition, there is potential to develop alternative forms of production techniques (recirculation, offshore, multi-trophic, organic, etc.) and new products, and for differentiation of aquaculture products.

The salmon farming industry faces issues of social acceptability, i.e. concerns on the impact on wild salmonid stocks, in particular escapees reducing fitness through genetic introgression and transmission of sea lice from farmed stocks, compromising the survival of wild smolts. Publication of data on escapees and lice counts has been introduced to increase transparency, and schemes have been introduced to reduce escapes (through containment standards). Establishing transparent environmental monitoring plans and reporting and collection by competent authorities of data on environmental indicators of aquaculture activities is important in this respect.

Water quality (high levels of pollution/containment on river-borne water) is also an important challenge for aquaculture in this sea basin.

Administrative burden remains also a challenge for the growth of the sector in the North Sea.

6. Enabling climate change adaptation and mitigation



Data source & visualisation: EMODnet physics portal

Average Sea Surface Temperature (SST) for months January and August (1990 to 2015) for the North Sea (analysis of in situ data)

The slow but steady increase of the Sea Surface Temperature (SST) in the North Sea is an indicator of climate change. The effects of the changes in sea temperature, which besides the increase of the average SST is also visible in the form of extreme phenomena, will inevitably influence all aspects of North Sea coastal and marine social-ecological systems, including blue economy sectors and adaptation/mitigation strategies.

7. Fostering the local development of a sustainable blue economy

The blue economy of the North Sea is one of the strongest in the EU. Given the large size of the ports of Rotterdam, Antwerp and Hamburg and the importance of the extraction of crude oil by Denmark and the Netherlands, there is a certain concentration in these sectors.

In the North Sea, the importance of large ports make port activities and maritime transport the main sectors in terms of GVA (EUR 15 billion in both cases) and the second and third largest sectors in terms of employment (0.20 and 0.15 million people respectively) behind coastal tourism (0.32 million people). Non-living resources are also relatively important in terms of GVA (EUR 11 billion).

The North Sea region can reflect upon the experience of Community-Led Local Development (CLLD**)** to foster the sustainable development of the blue economy at local level.

Between 2014 and 2020, there were 23 FLAGs active in the North Sea area, covering on average 6 178 km² – the largest of all sea basins – and a population of 86 832 people. The fisheries sector employs on average 1 100 workers in each FLAG area, 41% in the catching sector and 56% in processing, while aquaculture represents merely 3% of employment. With an average EMFF contribution of EUR 1 065 324 during the 2014-2020 period, these FLAGs have a total budget of EUR 1 617 138, the lowest among sea basins. Their strategies are largely focused on adding value to local catches and on diversification outside the fisheries sector.

Challenges in the North Sea include:

- the lack of a critical mass in the remaining pockets of SSCF;
- usage conflicts between traditional activities such as fishing and new marine sectors such as offshore energy or tourism;
- the need to adapt to climate change.

However, FLAGs can seize opportunities such as:

- developing sustainable quality labels and diversifying the range of species consumed to take advantage of the large affluent urban markets nearby;
- boosting development based on maritime heritage and cuisine;
- getting involved in the mitigation of climate change;
- organising the SSCF sector to give them a voice in maritime spatial planning processes.

Through multi-funding, these FLAGs could broaden the scope of their action and address other challenges in their communities such as:

- the provision of training and education;
- linking the industry with research and innovation centres;

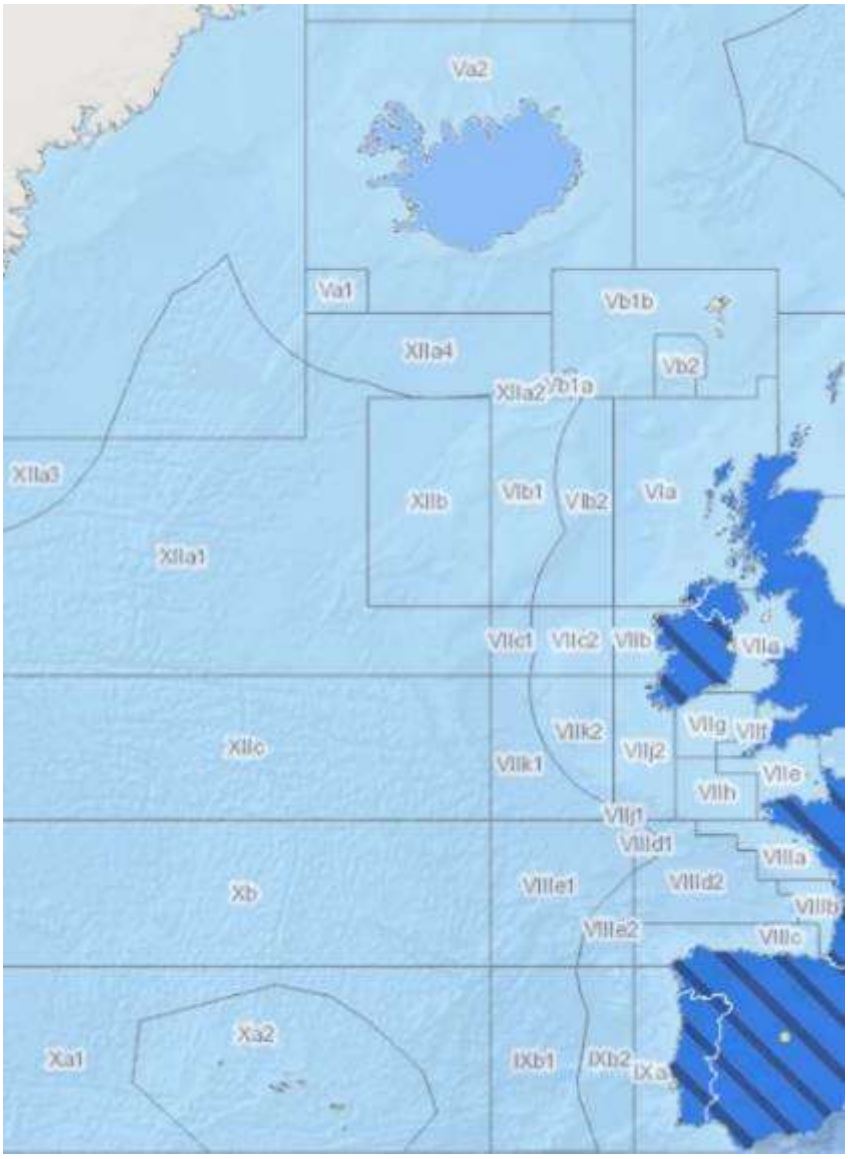
- supporting young people’s access to the fisheries and aquaculture sectors;
- providing services for the elderly or fostering the integration of migrants and refugees.

Multi-funding could also be used to create specific infrastructure such as local community centres or common processing units made necessary by the implementation of the discard ban.

WESTERN WATERS

1. Scope

The Western Waters sea basin comprises ICES subdivisions V, VI, VII (except VIId) and VIII, IX, X, XII[70]. The main Member States operating in the sea basin are Spain, France, Portugal and Ireland. Belgium, Denmark, Germany, Lithuania, the Netherlands also have some fleet segments active in area.



The Western Waters basin is composed of two main ecoregions: the Celtic Seas on the one hand, and the Bay of Biscay and the Iberian Coast on the other.

The Celtic Seas ecoregion encompasses the waters of the west of Scotland, the Irish Sea, the west and south of Ireland and the western part of the Channel. This wide range of latitudes stretches from the Scottish Shetland Islands in the north to the French coast of Brittany in the

[70] To ensure consistency, the area equivalent to the 'Northeast Atlantic region' in the STECF fleet report was used for this exercise.

south. They are marked by seasonal variations in both weather and temperature. Overall temperature trends and variation can have marked impacts upon migration, distribution and recruitment of key commercial fish stocks. There are also a series of important troughs and shelfs leading into the Atlantic ocean that contribute to high overall species richness[71].

The Bay of Biscay and the Iberian Coast ecoregion is characterised by marked seasonal wind changes that strongly affect the productivity of the system. These meteorological phenomena can cause speed and direction anomalies of the wind during winter that may influence the recruitment of commercially important fish species such as anchovy, sardine and horse mackerel. Seasonal patterns can be disrupted by Mediterranean water spilling into the Atlantic through the Strait of Gibraltar in the Gulf of Cadiz and by freshwater discharges from main rivers[72].

2. Ensuring a sustainable management of natural resources

The most important species in Western Waters include Atlantic mackerel, horse mackerel, hake, Norway lobster and monkfish. In terms of value of landings, the French and Spanish fisheries have the highest level of landings in the basin. However, Ireland, Portugal and France have the highest percentage of national landed value from the basin at 92%, 65% and 71% respectively.

2.1 Applying the precautionary approach and achieving maximum sustainable yields

Status of stocks in the Western Waters (source: STECF report 'Monitoring the performance of the CFP', STECF-Adhoc-19-01)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of stocks for which fishing mortality (F) exceeded F_{MSY}.															
BoBiscay & Iberia	7	7	8	8	8	8	7	6	6	6	7	7	6	6	3
Celtic Seas	13	12	13	14	16	16	14	12	9	12	8	8	8	9	9
Northeast Atlantic	5	4	4	3	3	3	2	3	3	1	2	2	2	2	2
Number of stocks for which fishing mortality (F) exceeded F_{MSY}.															
BoBiscay & Iberia	6	5	6	6	5	4	4	2	2	3	2	4	3	1	0
Celtic Seas	11	11	10	9	10	10	8	8	9	10	9	9	9	9	9
Northeast Atlantic	3	4	3	3	3	1	1	1	1	0	1	0	0	1	2
SSB relative to 2003															
BoBiscay & Iberia	1.00	1.02	1.01	1.06	1.10	1.13	1.20	1.30	1.58	1.58	1.47	1.66	1.81	1.91	2.15
Celtic Seas	1.00	0.87	0.73	0.71	0.72	0.79	0.76	0.78	0.94	0.96	0.86	0.80	0.98	1.15	1.24
Northeast Atlantic	1.00	1.05	1.06	1.07	1.05	1.06	1.10	1.20	1.37	1.43	1.43	1.46	1.52	1.57	1.57

Strengths

Many stocks in the basin are fished inside safe biological limits and have generally progressed towards MSYs. As from 2020, for all target stocks, listed as such in the Western Waters Multiannual Plan fishing opportunities are established in line with MSY ranges. For stocks such as northern hake and southern hake, the fishing opportunities have been set in the upper part of the MSY range to limit their annual variation to 20%, or to take account of mixed fisheries considerations in order to avoid the effect of 'choke species'.

Challenges

Some stocks in the basin remain outside safe biological limits and additional measures need to be taken for their recovery. Recent advice from ICES also shows worrying decreases in key gadoid stocks such as the Celtic Sea cod, and whiting in the Irish Sea and in the west of Scotland. The diversity of catches, especially of demersal non-TAC species, presents a challenge to both mixed fisheries management and the implementation of the landing

[71] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/CelticSeasEcoregion_EcosystemOverview.pdf

[72] https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/BayofBiscayandtheIberianCoastEcoregion_EcosystemOverview.pdf

obligation. In South Western Waters, examples of stocks outside safe biological limits are sardines and Norway lobster in the south of the Bay of Biscay. Stocks in the South Western Waters tend to have precautionary scientific advice. This, coupled with the high species richness and diversity of non-TAC catches, has made mixed fisheries management challenging.

2.2 Implementing the ecosystem-based approach to fisheries management

Strengths

Scientific knowledge on the structure and functioning of the ecosystems is steadily improving and recently ICES started providing ecosystem overviews and integrated ecosystem assessments. These highlight an overall stable system, with some key drivers influencing ecosystems: fishing, oil and gas activities, transportation, ports and aggregate sand extraction, etc. ICES also provides an overview of the multi-species interactions that is enabling more targeted management measures. This additional scientific background is used to further inform the fisheries management decisions relevant for this sea basin. In addition, this scientific background could be used in the development of Maritime Spatial Planning initiatives, which would allow for a more balanced exploitation of the ecosystem by the various human activities.

Challenges

Sea temperature affects the recruitment of some gadoids in the Irish Sea, Celtic Sea, and west of Scotland. The Celtic Seas ecoregion is at the edge of the geographical range of several species, potentially making these species more susceptible to environmental variation. There is a need to better understand the influence of environmental factors on the more sensitive species.

2.3 Eliminating discards and making the best use of unwanted catches

Strengths

Various selectivity measures have been introduced in all areas. The overall picture is stable, with the total discard tonnage (and therefore rate) of pelagic species estimated to be very low. Discards of demersal, crustacean and benthic species are estimated to be around 10%.

Challenges

Discard rates for some species are very high, for example plaice (around 60% of tonnage) and whiting (50–99% of tonnage). Despite discarding not being legal (unless allowed through specific exemptions), the gap between reported landings and estimated catches by scientists indicate that discarding practices have continued, in particular for stocks that are not commercially valuable.

In the South Western Waters, information for estimating discards is often not available, as fishermen were not recording discards in the past. The situation is also complicated by the fact that certain fleet segments are composed from small vessels with less rigorous record data.

The South Western Waters Member States face challenges in the collection of supporting information necessary for high survivability and *de minimis* exemptions, as discard data are not always available.

2.4 Ensuring coherence with environmental legislation

Strengths

According to the Oslo Paris Convention for Protection of the Marine Environment of the North-East Atlantic (OSPAR), the Celtic Seas and the Wider Atlantic have one of the best coverages of marine protected areas (MPAs) in the OSPAR region. In 2017, 15% and 8.3% respectively

of these areas were covered by MPAs[73]. However, the Bay of Biscay and Iberian Coast rank lower, with 5.9% covered by MPAs. Including designated Natura 2000 areas, the Celtic Seas has an above-average coverage of MPAs, while the Bay of Biscay and Iberian Coast have an average coverage of MPAs[74].

Challenges

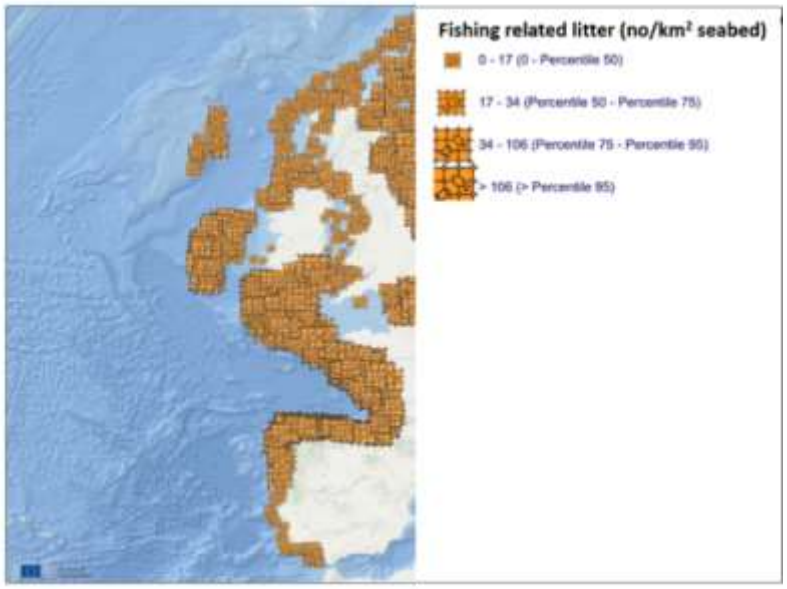
The Celtic Seas are undergoing a change in temperatures, with long-term datasets indicating a rise in sea surface temperature for several decades, peaking in 2006. Since 2006, a steady cooling trend has been noted. Temperature affects the migration, distribution and onset of spawning of blue whiting, Northeast Atlantic mackerel, western horse mackerel and boarfish, as well as the recruitment of some gadoids in the Irish Sea, Celtic Sea and the west of Scotland. The Celtic Seas ecoregion is at the edge of the geographical range of several species, potentially making these species more sensitive to environmental variation[75].

The main pressures on the ecosystem are selective extraction of species, abrasion, smothering, substrate loss, and nutrient and organic enrichment linked mainly to human activities such as fishing, aquaculture, coastal construction, land-based industry, maritime transport, agriculture, dredging, and offshore structures for renewable and non-renewable energy sources. In the Bay of Biscay and the Iberian Coast, other pressures include the introduction of contaminating compounds, introduction of non-indigenous species and underwater sound.

Despite the coverage of MPAs in the basin, marine litter remains a significant problem. The available data for the Western Waters region regarding marine litter (beach and seabed) show that intense monitoring and collection efforts are taking place, while also demonstrating the severity of the problem in the area. The majority of beach litter identified in the Western Atlantic region is made up of artificial polymer materials (most plastics). The monitoring and collection efforts showcase the severity of the problem of marine litter both on the coastline and on the seabed, with the majority originating from fisheries and other human activities. The density of fisheries- and plastic bag-related litter is surely affecting the seabed communities, while trawling efforts required to remove the litter from the seabed can also negatively affect the seabed ecology. Although Member States' interest in using EU funding to involve the fishing industry in reducing marine litter has drastically increased, the lack of indicators and monitoring hinders evaluation of the effectiveness and efficiency of marine litter-related action[76].

As no information is available for the state of the deeper waters, the density of plastics on the seabed is unknown. Preventing the entrance of new marine litter into the North East Atlantic waters should be prioritised, while the monitoring and collection efforts should continue if the problem is to be effectively tackled. Regarding beach litter monitoring, the Member States should aim to ensure that monitoring and collection efforts cover their whole coastline.

[73] www.ospar.org/site/assets/files/1378/assessment_sheet_mpa_status_2017.pdf
[74] www.eea.europa.eu/publications/marine-protected-areas
[75] www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/CelticSeasEcoregion_EcosystemOverview.pdf
[76] https://webgate.ec.europa.eu/maritimeforum/en/system/files/AT01.2_marine_litter_final_report%20170925_CLEAN.pdf



Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas

Density of fishing-related seabed litter (number of items per km²) in the North East Atlantic region per trawl, per year, obtained during monitoring surveys (data availability: 2007-2018)

Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas

Density of plastic bag-related seabed litter (number of items per km²) in the North East Atlantic region per trawl, per year, obtained during monitoring serveys (data availability: 2007-2018)

3. Improving enforcement and control of fisheries and the provision of data

3.1 Collection of scientific data

Strengths

Data collection is well established for the Western Waters sea basin. All Member States concerned have had an institutionalised operational data collection management system in place for more than a decade. Data collection, based on both fisheries-dependent data and fisheries-independent data, covers all the relevant areas the Member States need to report on.

Despite some reported problems (e.g. shortcoming of observer programme coverage), the Member States in this region have fully carried out data collection activities during the 2014-2020 EMFF period and have responded to data calls from scientific end users.

ICES's RDB is a strong tool supporting the evaluation of data collection both for the Regional Coordination Groups (RCGs) on data collection organised per sea basin at EU level and for ICES as end user. Due to the variety and high number of fisheries, some Member States have experienced minor difficulties in reaching deadlines or replying in the correct format to certain data calls. However, data are collected, and these Member States are collaborating with end users and the Commission and improving their performance when responding to data calls.

Within the region, cooperation among Member States is mainly driven by the RCG North Atlantic, which merged with the North Sea and Eastern Arctic RCGs and counts 14 Member States[77]. Although the RCG Baltic maintains separate meetings, common terms of reference and a common tasks plan for the next 3 years were established during 2019. It includes the three RCGs: North Atlantic and North Sea and Eastern Arctic, which became NANSEA, and the Baltic. Member States are coordinating in this context in fields including: (i) updating of data collection requirements; (ii) joint data collection methodologies and approaches to respond to data calls (enhancing consistency); (iii) strong cooperation on the scientific surveys by dedicated vessels; (iv) improved quality checks by Member States before uploading of data; and (v) regional database use.

Challenges

Sampling methods need to be further improved to live up to the ambition of the 2017 EU Data Collection Regulation[78], in particular for discarding, unwanted catches, incidental by-catches of listed prohibited and sensitive species by commercial fisheries, and for data collection based on pilot studies planned under the current EU-MAP on recreational and small-scale fisheries. The MARE/2016/22 fishPi2 study (commissioned for the whole of the Atlantic EU waters including the North Sea) has identified and proposed such sampling programmes. They need to be discussed among Member States, and implemented and regionally coordinated in the near future. Similarly, positive experiences from pilot studies developed by individual Member States in the above-mentioned fields also need to be integrated into the mainstream data collection activities, in particular under a new EU-MAP for data collection.

Member States upload data to the RDB regional database hosted and maintained by ICES. Scientists, including ICES staff, are developing a new database called RDBES (Regional Data Base and Estimation Sampling). This is a promising tool that will improve the quality of the data used in the scientific advisory process and will facilitate Member States' submission of annual reports to the Commission. However, the change to another database may involve changes in the Member States' sampling methodology. This is a challenge to address regionally.

New obligations on data collection for sensitive species have been introduced in the Technical Measures Regulation[79], which requires Member States to take the necessary steps to collect scientific data on incidental catches of sensitive species. Advice on sampling of by-catches of

[77] BE, DK, EE, FI, FR, DE, IE, LV, LI, NL, PT, PL, ES, SE.
[78] Regulation (EU) 2017/1004, repealing Council Regulation (EC) No 199/2008.
[79] Regulation (EU) 2019/1241, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.

cetaceans has been provided by the STECF[80] and advice on sampling of all sensitive species is also available from ICES. Compliance with this requirement involves increased efforts on data collection, observer coverage and on-board electronic monitoring.

Continued challenges in the field of data collection are:

- further coordinated improvement of quality checks (including relations with the RDB in ICES);
- training of national data collection staff;
- work on stakeholder buy-in (notably buy-in by fishers as regards filling out logbooks in a reliable manner);
- increasing coverage of observer trips.

Regional cooperation in the context of the RCG remains a challenge.

3.2 Enforcement and control

Strengths

In the Western Waters area, all Member States have implemented a basic fisheries control infrastructure (patrol vessels, surveillance aircraft, electronic recording and reporting systems, FMCs, etc.). Like in other sea basins, a key control component is the joint deployment plans (JDPs) coordinated by the European Fisheries Control Agency (EFCA), based on the relevant specific control and inspection programme (SCIP) adopted by the Commission. In regional fisheries management organisations in non-EU waters, specific multiannual working groups have been set up over the years in order to foster collaboration and exchange of best practices and to develop harmonised control measures. In the context of the North East Atlantic Fisheries Commission (NEAFC), contracting parties agreed in 2018 to implement international standards promoted by the EU for electronic transmission of fishing logbook information to NEAFC.

Challenges

The control challenges in the Western Waters are very similar to those in the other sea basins. These are:

- ensuring implementation, control and enforcement of the landing obligation;
- improving the reliability of catch data, especially for stocks subject to quotas, including data on discards;
- improving systems and procedures for weighing of landings;
- improving the exchange of fisheries and control data between Member States;
- strengthening the control of the small-scale fleet and reinforcing the control of sales channels and the traceability of fish, including at the level of transport.

Investing in improved and innovative technology for fisheries monitoring and data reporting will help address these points. Finally, more needs to be done to carry out effective controls of engine power, either by carrying out physical verifications and/or by using modern technologies such as the installation of devices allowing continuous monitoring of engine power.

[80] Scientific, Technical and Economic Committee for Fisheries (STECF) – Review of the implementation of the EU regulation on the incidental catches of cetaceans (STECF-19-07).

4. Ensuring a balanced socio-economic outlook for the fisheries sector

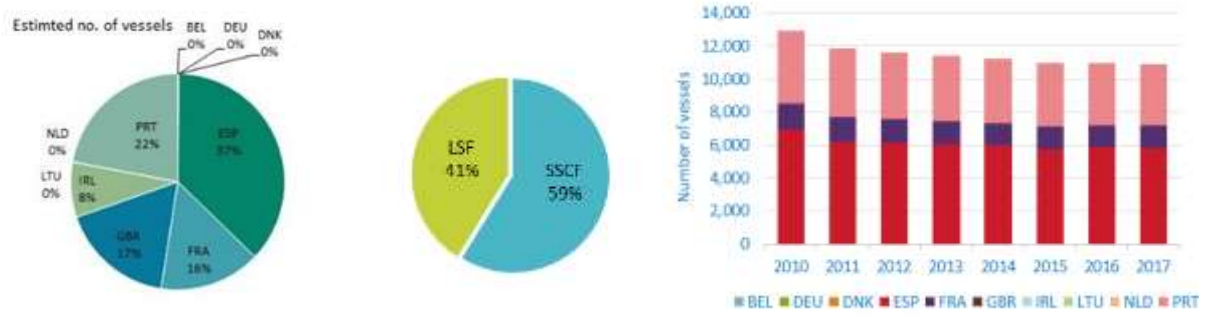
Fleets operating in the region have followed a general decreasing trend over most of 2010-2017, apart from a slight increase in 2015 and 2016. The 10 Member State fleets operating in the region in 2016 (UK included) comprised over 13 900 active vessels, a fall of 5% from 2015. This makes the Western Waters the second-biggest region after the Mediterranean in terms of vessel numbers. The Spanish fleet had the largest number of vessels (around 5 251 active vessels or 37% of the total in the region).

LSF generated by far the highest landed weight, at 91% of the total and 85% of the value. In 2016, nine Member States operated large-scale fleets in the NE Atlantic region, with a total of 5 834 active vessels. Spain and France responsible for the largest number (2 881 and 1 042 active vessels, respectively). For Ireland and Portugal, 98% and 83% of their large-scale fleets were active in the area.

SSCF accounted for 59% of the number of vessels and 47% of the days at sea but only 9% of the landed weight, 15% of the landed value, 39% of the total jobs and 27% of the total FTEs (17 390 jobs and around 8 718 FTEs in 2016). They came from five Member States (the UK, Ireland, France, Spain, Portugal). While 100% of Irish and 99% of Portuguese SSCF fished in the NE Atlantic in 2015, these waters represented only part of the SSCF fishing activity for Spain (66%) and France (83%), as they were also active in the Mediterranean Sea and/or the North Sea. Portugal and Spain had the highest number of active SSCF vessels, with 2 486 and 2 369 vessels, respectively.

Trends in the number of vessels for fleets operating in the Southern Western Waters regions

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[81]



Data source: Member State data submissions under the DCF 2018 Fleet Economic (MARE/A3/AC(2018)).[82]

Share of NE Atlantic fleet capacity by MS and fishing activity, 2016

4.1 Providing conditions for an economically viable and competitive fishing sector

Strengths

Fishing effort decreased significantly in line with the number of vessels in 2010-2017. The Western Waters fleet spent over 1.49 million days at sea in 2016, 43% of which were by the

[81] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 158).

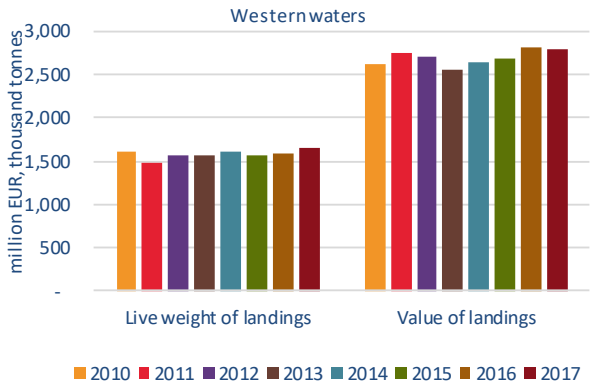
[82] Scientific, Technical and Economic Committee for Fisheries (STECF) – The 2018 Annual Economic Report on the EU Fishing Fleet (STECF-18-07). Publications Office of the European Union, Luxembourg, 2018, JRC112940, ISBN 978-92-79-79390-5, doi: 10.2760/56158 (p. 145).

Spanish fleet[83]. A significant drop took place in 2013. This can be largely attributed to the Spanish fleet, which has shown a significant decrease in recent years to bring fishing capacity into balance with fishing opportunities[84]. Since then, there was some increase in 2016, which seems to stabilise in 2017.

Between 2016 and 2017, the volume of landings increased by 4.2% (1 648 million tonnes in 2017 against 1 581 million in 2016), while the value fell slightly by 0.3% to 2.8 billion in 2017. Both values have increased since 2010 (1.7% in terms of volume and 6.4% in terms of value). In terms of landed weight, the French (357 000 tonnes), Spanish (340 000 tonnes), Irish (207 000 tonnes), Dutch (146 000 tonnes) and Portuguese (133 000 tonnes) were the leading national fleets, accounting for over 93% of the total weight landed. In terms of landed value, the French (EUR 886 million), Spanish (EUR 703 million), UK (EUR 516 million), Portuguese (EUR 293 million) and Irish (EUR 232 million) fleets together accounted for around 95% of the total value of landings in 2017.

Trends in landings for MS fleets operating in the Western Waters region

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015)[85]



Fuel consumption has also followed a general downward trend since 2010, more accentuated in 2014, after which energy consumption increased in 2016 and 2017, reflecting increased effort and lower fuel prices. Fuel is a significant operational cost and therefore an important driver of higher revenues in 2016 and 2017.

Labour productivity (GVA/FTE) has consistently increased since 2010, particularly for the large-scale fleet, with an increase of 78% between 2010 and 2017. For the SSCF, labour productivity took several years to start improving, but it has also significantly improved (by 45% between 2010 and 2017).

Trends in labour productivity (GVA per FTE) by fishing activity for fleets operating in the Western Waters region

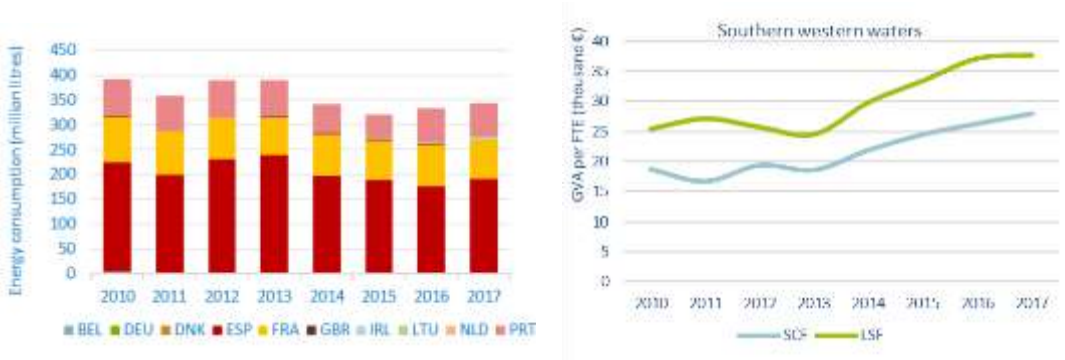
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015)[86]

[83] Ireland had partial effort data for vessels less than 10 m in length and only for 2013-2016, so conclusions regarding effort need to be drawn with caution, as Ireland's effort is underestimated for this segment.

[84] Between 2008 and 2015, 3 656 vessels ceased activity and the decreasing trend in vessel number, engine power and gross tonnage is expected to continue in the coming years.

[85] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 143).

[86] Footnote 85 (p. 157).

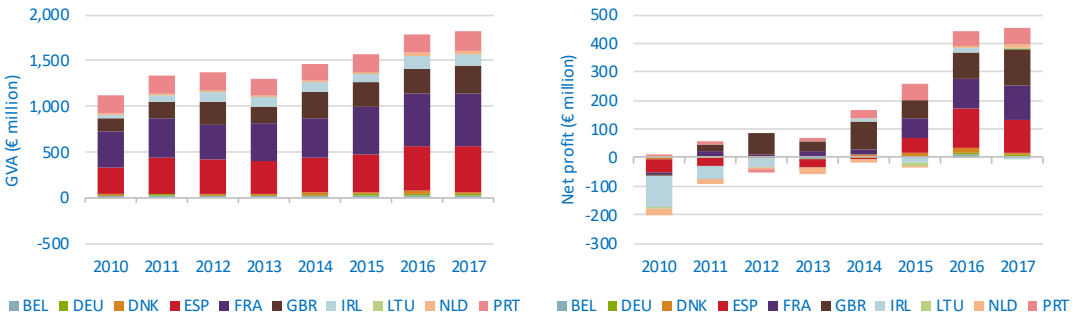


Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[87]

Trends in energy consumption for fleets operating in the Western Waters region

Reflecting the steady improvements described above, the overall performance of the fleets operating in the Western Waters has significantly improved compared to 2010, and particularly so since 2013. For instance, between 2010 and 2017, GVA increased by 64% (from EUR 1.11 billion to EUR 1.82 billion), gross profit grew by 250% (from EUR 190 million to EUR 665 million) and net profit turned from negative (with a net loss of EUR 190 million in 2010) to positive (with a net profit of EUR 455 million in 2017). Five fleets (France, Spain, the UK, Ireland and Portugal) produced 95% of this revenue, but the situations of national fleets vary: increases in revenue were lower than 10% in five Member States and far greater for three Member States (Germany 13%, Ireland 38%, Denmark 66%), and two Member States suffered a fall in revenue (Netherlands: -2%; Lithuania: -72%). These variations in total annual revenue reflect mainly the fluctuations in TACs and quotas and fish prices, on which the Atlantic fleets are particularly dependent. Overall, even though the total landed weight decreased, the value of landings increased in 2017 compared to 2015, and this largely explains the increase in revenue, as was the case in previous years.

The GVA generated was estimated at EUR 1.82 billion in 2017, an overall increase of 1.9% compared to the previous year. The highest increases in GVA are observed for the Dutch, British and Spanish fleets (25.6%, 8.5% and 5.7% respectively). On the other hand, significant decreases in GVA were observed for the Danish, Lithuanian and German fleets. The Western Waters are not the main fishing areas of these fleets and a fluctuation in GVA is observed throughout the years. For the Irish fleet, we observed a 7.4% decrease in GVA. After accounting for operating costs, the fleet made EUR 665 million in gross profit, a decrease of 3.8% compared to 2016. All national fleets operating in the region generated gross profits.



[87] Footnote 85 (p. 159).

Trends on profit (GVA and net profit) for fleets operating in the Southern Western Waters region
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015)[88]

Overall, most Western Waters fleet segments were profitable. The SSCF generated EUR 522 million in revenue in 2017, while the LSF generated EUR 2.5 billion in revenue (1.2% increase on 2016), EUR 1.463 billion in GVA and EUR 548 million in gross profit. Within the LSF, the French fleet generated the highest revenue (EUR 785 million), followed by those of Spain (EUR 665 million), Ireland (EUR 232 million) and Portugal (EUR 212 million). France generated the highest gross profit (EUR 156 million) and the Danish LSF was the most profitable in terms of gross and net profit margins (75% and 84% respectively).

The factors that have contributed to the positive situation include the recovery of some stocks (e.g. the biomass of most herring stocks has increased and the northern hake stock continues to follow a positive trend) and the ensuing increased TACs for a number of stocks, (e.g. hake, herring and anglerfish), stable fish prices generally and higher average prices for some important species (e.g. common sole and Nephrops) and continued low fuel prices resulting in lower energy costs, especially for pelagic fisheries.

Challenges

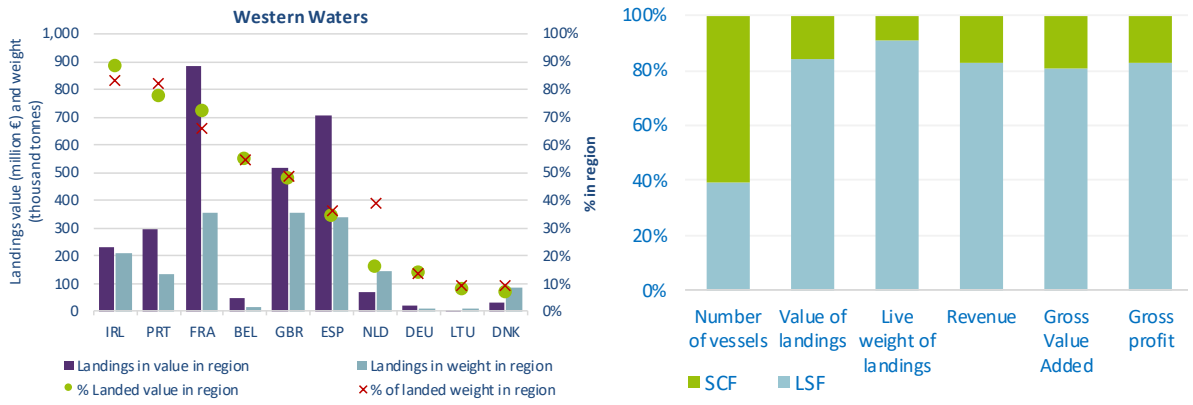
Fluctuations in TAC and quotas significantly influence trends in the landings of certain stocks such as the Atlantic mackerel, blue whiting and hake. Mackerel went through a significant increase in 2014 followed by a decrease in 2015, which impacted the total value of landings for Member States targeting this species. Resilience and adaptation pending stabilisation of the situation of the stocks is a challenge, also because of the lower average prices and total landings for plaice, common shrimp, herring and mackerel.

Member States are highly dependent on the Western Waters region. In terms of value of landings, Ireland, Portugal and France depend on the Western Waters for more than 70% and Belgium and Spain between 35% and 60%. For other Member States, dependency on the Western Waters is below 20%.

Small-scale fisheries constitute around 60% of the vessels operating in the region but they generate a smaller share of GVA and gross profit (19% and 17% respectively), with the large-scale fleet contributing more than 80% of GVA and gross profit in this fishing region. Therefore, while the consequences of Brexit are unknown, it can be expected to have a large impact on fleets operating the NE Atlantic. The UK holds a significant portion of the landings. Furthermore, a number of Member States (Ireland, France, Spain, Belgium, the Netherlands and Germany) are highly dependent on UK waters.

Share by fishing activity in Western Waters, 2017
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[89]

[88] Footnote 85 (p. 161).
[89] Footnote 85 (data from Figure 4.46 p. 142 and Figure 4.60 p. 155).



Importance of the Western Waters region for fisheries in terms of landings in weight and value, 2017

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015)[90]

4.2 Addressing overcapacity

Western Waters- Active fleet segments out of balance

Member States	Total number of active fleet segments	Number of fleet segments assesssed	% of total value of landings assessed	Number of assessed fleet segments out of balance	% of assessed fleet segments out of balance
FR	51	21	75%	9	43%
IE	32	14	82%	14	100%
ES	52	25	63%	15	60%
PT	55	7	30%	4	57%
UK	44	19	77%	7	37%
Region Total	**234**	**86**	**-**	**49**	**57%**
EU Total	602	255	42%	190	75%

Source: Assessment of balanced indicators and review of national reports on Member States' efforts to achieve balance between fleet capacity and fishing opportunities (STECF-19-13). Note: this table covers all segments fishing in FAO 27. The assessment is based on the sustainable harvest indicator.

Challenges

Fleet imbalance remains a concern for some fleet segments, in particular in Spain and Ireland[91].

In 2019, action plans were submitted by France and Spain. The French action plan targets three segments. For the Bay of Biscay segments (vessels 12-18 metres long fishing Norway Lobster or European Pilchard), a ban on new vessels is the described measure. For vessels shorter than 24 metres fishing eel as by-catch in the Atlantic (currently 451 vessels), a reduction of the fleet by 16-17 vessels is set out by the end of 2020.

The Spanish action plan points to permanent cessation, allocation of fishing opportunities and temporary cessation to address imbalances in five segments[92].

[90] Footnote 85 (data from Figure 4.47 p. 142 and Figure 4.61 p. 155).

[91] For Portugal, only few fleet segments could be meaningfully assessed for the sustainable harvest indicator because the indicator values for 37 segments are based on stock that comprise less than 40% of the total value of landings by those fleet segments.

[92] Demersal trawlers/seiners 10-24 m and 24-40 m, drift/fixed netters 18-40 m, vessels using hooks up to 18 m and purse seiners 24-40 m.

Western Waters - Support to the permanent cessation under the EMFF						
Member State	**Number of vessels**	**Vessels - Share of EU total**	**Total eligible public cost committed**	**EMFF support committed**	**EMFF - Share of region's total**	**EMFF - Share of EU total**
ES	25	2%	3.655.932	2.612.734	59%	3%
FR	15	1%	1.655.081	827.540	19%	1%
PT	6	0,5%	1.907.741	953.870	22%	1%
Region Total	**46**	**4%**	**7.218.754**	**4.394.144**	**-**	**6%**
EU Total	1.260	-	148.925.930	75.256.543	-	-

Source: Commission communication on the State of Play of the Common Fisheries Policy and Consultation on the Fishing Opportunities for 2020 (COM(2019) 274 final)

4.3 Contributing to a fair standard of living for those who depend on fishing activities

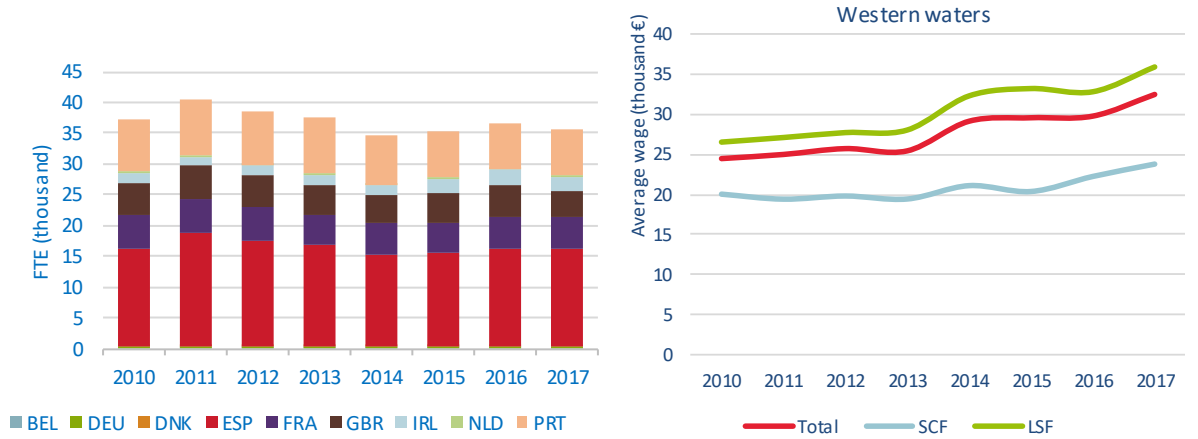
Strengths

It seems that the overall declining trend in employment came to a halt in 2017, at 52 500 jobs. This was 1.8% up on 2016, mainly driven by the LSF. However, employment in the Western Waters in terms of FTEs declined by 3% from 36 600 in 2016 to 35 500 in 2017. The most important fleets in terms of overall employment are those that have the highest dependency on the Western Waters. Spain has the highest level of employment, with over 16 020 FTEs in 2017, followed by Portugal (7 300), France (5 090), and Ireland (2 360). Total employment for the LSF is highest for Spain and Portugal, at 11 490 and 4 770 FTEs respectively, reflecting the high number of active vessels in these Member States.

Improvements in overall profitability translated into improvements in wages, although this varied by fleet segment. The average yearly wage per FTE for the SSCF has been rather stable between 2010 and 2015 (around EUR 20 000, but growing in 2016 and 2017 to reach almost EUR 24 000 in 2017 (with a 7% annual increase)). For the LSF, the average wage grew continuously from 2010 to reach almost EUR 36 000 in 2017 (with a 9% increase on 2016).

Trends in average wage by fishing activity for fleets operating in the Western Waters region

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015)[93]



Trends in employment (in FTE) for fleets operating in the Western Waters region

[93] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (data from Figure 4.49 p.144 and Figure 4.63 p. 157).

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[94]

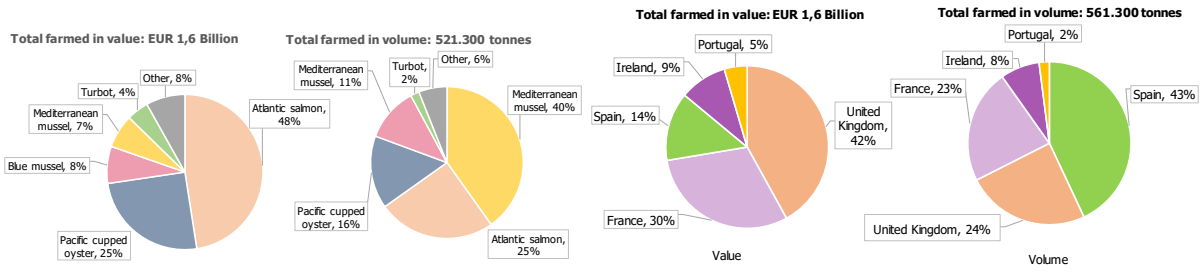
Challenges

Overall, small-scale fisheries were profitable in 2015, totalling EUR 353 million in GVA and EUR 114 million in gross profit. The most profitable in terms of gross and net profit margins was the Portuguese SSCF at 40% and 30%, respectively. Although all national SSCF fleets had positive net profits in 2017, a significant decrease in net profits was registered in Ireland (from EUR 4.06 million in 2016 to EUR 0.08 million in 2017). On the other hand, the net profit increased significantly in Spain (from EUR 8.0 million in 2016 to EUR 11.3 million in 2017). In terms of productivity, the GVA per FTE varied from EUR 19 500 (Spain) to EUR 98 000 (France). The French fleet (EUR 195 million) accounted for 37% of the total SSCF revenue while the Spanish fleet accounted for 45% of the FTEs (4 530 FTEs).

Total employment for the SSCF is highest for Portugal and Spain, at 7 412 and 6 831, respectively, reflecting the high number of active vessels in these Member States. All Member States demonstrate a much lower FTE figure than total number of employed in the sector, which indicates that a large majority of those employed in the SSCF are part-time or occasional workers.

5. Promoting a sustainable and profitable aquaculture

The Western Waters region is the first aquaculture-producing region in the EU, thanks to its highly valued productions of salmon and oysters and the high volumes of mussels. The two main species in volume and value are Mediterranean mussels and European flat oyster. The main producing Member States are Spain and France, but their share differs according to volume or value, reflecting their specialisation: Spain is by far the main producer in volume given its specialisation in Mediterranean mussels.



Strengths

In 2016[95], it was estimated that 12 900 FTEs were employed in the aquaculture sector in the NE Atlantic, which is 29.5% of aquaculture employment in the EU. They generated a total of EUR 808 million of GVA.

Challenges

The lack of available sites and competition for space with other maritime activities limits the potential for further development of aquaculture. Identification and mapping of suitable areas for the expansion of aquaculture is therefore a priority. In the NE Atlantic, however, the best way to expand seems to be through additional innovation and cost-effective solutions by developing new technologies and forms of aquaculture. New technologies such as recirculation

[94] Footnote 93 (data from Figure 4.51 p. 145 and Figure 4.65 p. 158).
[95] Available data do not allow to a multi-year trend to be presented.

systems still have limited application due to cost, however; they are used only in Portugal for some valuable species such as turbot and sole, while multi-trophic systems are being developed in intensive aquaculture for seabass and seabream.

The shellfish sector faces high mortality rates and food safety issues (e.g. the problem of norovirus in oysters), particularly in France and Ireland, due to disease. A lot of work remains to be done in relation to disease control in the mollusc sector, and this is a key challenge for aquaculture development in this sea basin[96]. For salmon farming, challenges are related to disease (sea lice) and availability of seed (in Ireland). There is therefore a need to curtail excess mortality in the shellfish sector by strengthening biosecurity measures and improving animal health and welfare. Aquaculture in this area also faces environmental issues related to episodes of algal blooms and jellyfish swarms. Support to stock insurance schemes, notably in the shellfish segment, is therefore also particularly important given the impact of diseases and algae blooms on aquaculture farms.

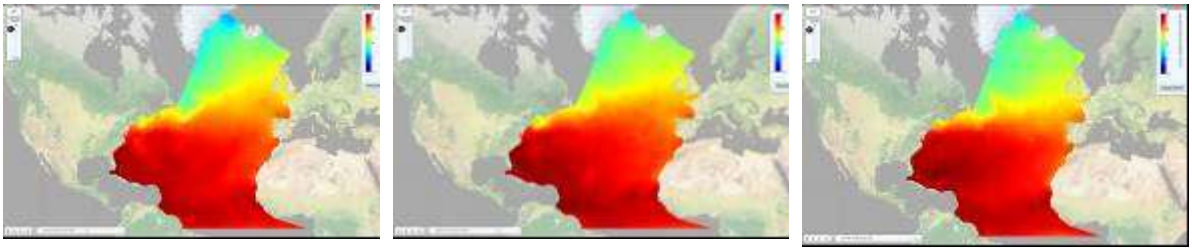
Given the increasing competition with products imported from non-EU countries, there is an increasing need to differentiate production, among other things by labelling and certification and species diversification. Communication to consumers on the quality and environmental standards of EU aquaculture will also help. There is a demand for further development of organic production, and the sector is sometimes unable to match this demand. There is also scope for improving the organisation of the sector (including through the establishment of new producer organisations) in order to increase its competitiveness, as well as creating partnerships between producer organisations and between producers and the processing industry, distributors and marketing chains.

Aquaculture in this area also faces environmental issues such as episodes of algal blooms and jellyfish swarms. Another issue is the need for more action by national authorities to improve and maintain water quality, particularly in shellfish farming areas.

Administrative burden remains one of the main challenges to the competitiveness identified by the sector.

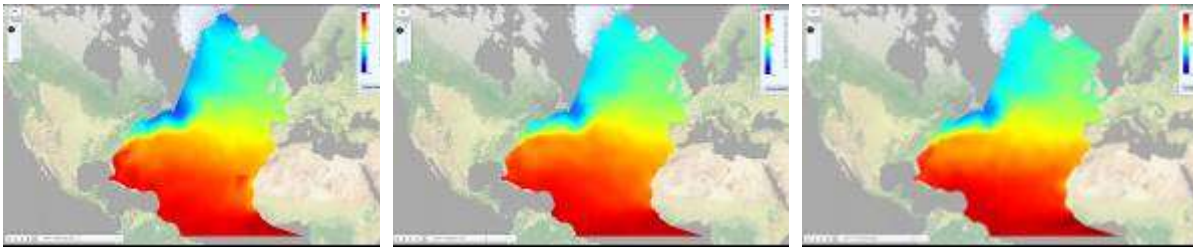
Finally, establishing transparent environmental monitoring plans and reporting and collection of data on environmental indicators of aquaculture activities is important to limit the environmental footprint of aquaculture activities and increasing their social acceptance.

6. Enabling climate change adaptation and mitigation



August 1995 August 2005 August 2015

[96] See Overview report Animal Health Controls for Bivalve Mollusc Aquaculture (http://ec.europa.eu/food/audits-analysis/overview_reports/details.cfm?rep_id=125).



January 1990 January 2000 January 2010

Data source & visualisation: EMODnet physics portal

Average Sea Surface Temperature (SST) for January and August (1990-2015) for the Atlantic waters (analysis of in situ data)

The slow but steady increase of the SST in the Atlantic waters is an indicator of climate change. The effect of the changes in sea temperature, which besides the increase in average SST is also visible in the form of extreme phenomena, will inevitably influence all aspects of the Western Waters' coastal and marine social-ecological systems, including blue economy sectors and adaptation/mitigation strategies.

7. Fostering the local development of a sustainable blue economy

The blue economy of the Western Waters region is the strongest of the EU. It generated €73.4 billion in GVA and employed 1.29 million people in 2017. The GVA is generated mainly by coastal tourism (EUR 27 billion) followed by non-living resources (EUR 16 billion), port activities (EUR 12 billion) and living resources (EUR 7 billion). In terms of employment, coastal tourism (0.76 million people) employs more than all the other sectors combined. Port activities (0.18 million people) and living resources (0.17 million people) are also sectors offering significant numbers of jobs.

The Commission adopted an Atlantic maritime strategy in 2011 in response to repeated calls from stakeholders for more ambitious, open and effective cooperation in the Atlantic Ocean area. The strategy identified the challenges and opportunities facing the region. The recently revised action plan highlighted four priorities for the development of blue economy in the region: i) supporting ports as gateways for blue economy development, ii) strengthening blue skills, iii) developing marine renewable energy and iv) investing in a healthy ocean and resilient coasts.

The Western Waters region can build on the experience of CLLD to foster the sustainable development of the blue economy at local level.

In 2014-2020, there were 70 FLAGs in the Western Waters area, covering on average 1 299 km² – well below the 2 277 km² average in all sea basins – and a population of 122 995 people. The fisheries sector employs on average 1 571 workers in each FLAG area, well over the average of 716 for all sea basins, of which 42% are in the catching sector and 37% in the processing sector; aquaculture represents 21% of employment.

Receiving on average an EMFF contribution of EUR 1 707 315 in 2014-2020, these FLAGs have a typical total budget of EUR 2 241 299, which is higher than the average for all sea basins. As with most FLAGs, their strategies focus on adding value to the local catches and on diversification outside the fisheries sector. Social issues are also targeted, but environmental and governance-related projects seem to have a lower priority than for the rest of the FLAGs.

Challenges in the Western Waters include:

- increasing influx of new residents ('gentrification') and seasonal tourism along the coastline;
- an uneven population density, with some areas being very remote and others are under heavy pressure from urbanisation and the growing tourism economy;
- an ageing workforce due to difficulties in attracting young people into fisheries and the lack of specific skills;
- the lack of integration of fisheries-dependent communities in territorial development;
- difficulties in accessing credit to start new activities.

Opportunities include:

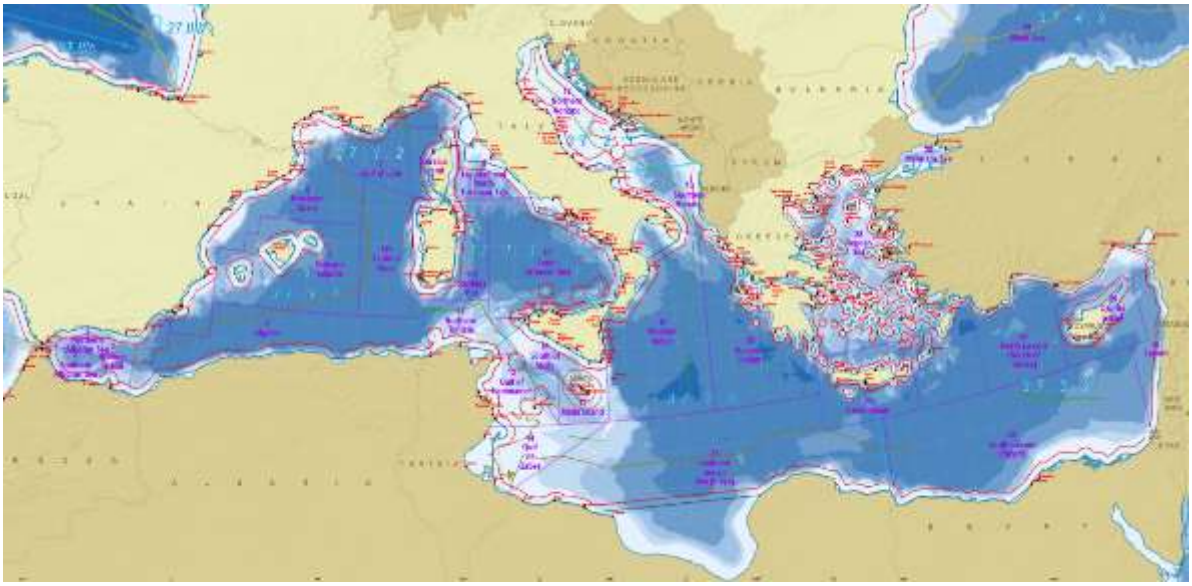
- helping fishing communities to adapt to the reformed CFP, including the use of less commercial species or the use of discards for non-human use;
- improving the quality of fisheries-related products from fisheries tourism to local seafood products;
- promoting short supply circuits, high-quality local seafood products and local seafood markets;
- promoting innovative aquaculture attracting young skilled people, promoting the preservation and recovery of natural resources, including MAPs;
- tackling environmental challenges through local actions to reduce pollution;
- revalidation of local fisheries cultural heritage and actions to increase the diversification of income opportunities for fisheries-related economies;
- adjusting to the rise of the 'silver economy' (retirees coming to coastal areas);
- promoting innovation, particularly in blue biotech and renewable energy community-based schemes.

Moreover, the EU Atlantic maritime strategy pioneered marine renewable energies. This sea basin is likely to become a hotspot for future EU carbon neutrality. Since the establishment of the Atlantic action plan in 2013, at least 1 200 projects have been implemented worth EUR 6 billion. Most of the projects target environmental protection and innovation, as well as improved connectivity and social inclusion. Some 20 projects, involving 320 international research teams, are not just European but also involve transatlantic partners, thanks to the Galway Statement and the Atlantic Ocean Research Alliance between the EU, the US and Canada, as well as the Belém Statement signed with Brazil and South Africa.

MEDITERRANEAN SEA

1. Scope

The Mediterranean region covers FAO fishing areas 37.1, 37.2 and 37.3. Nine EU Member States are involved in Mediterranean fisheries: Croatia, Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia and Spain. Most of the nine Mediterranean Sea Member State fleets are wholly dependent on the region. The exceptions are Portugal, Spain and France, which also have major parts of their fleets operating in the Atlantic and other fishing regions.



The Mediterranean is a highly diverse basin, composed of a vast set of coastal and marine ecosystems, including brackish water lagoons, estuaries or transitional areas, coastal plains, wetlands, rocky shores and nearshore coastal areas, sea grass meadows, coralliferous communities, frontal systems and upwellings, seamounts and pelagic systems.

2. Ensuring sustainable management of natural resources

The Mediterranean fleet makes up 42% of all EU vessels and 45% of total EU fisheries jobs, yet accounts for only 8% of the total EU landings and 18% of the total landed value. This reflects the structure of the Mediterranean fleet, where over 70% of the vessels belong to small-scale coastal fleets, and the fact that most Mediterranean fish stocks are highly overfished and therefore have low productivity.

2.1 Applying the precautionary approach and achieving maximum sustainable yield

Status of stocks in the Mediterranean Sea (source: STECF report 'Monitoring the performance of the CFP', STECF-Adhoc-19-01)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
F/FMSY														
Cent. Med.	1.87	1.95	1.99	2.75	2.65	2.46	2.72	2.81	2.79	2.79	2.67	2.70	2.77	2.54
East Med.	2.33	2.14	2.85	2.22	2.88	2.88	2.87	3.29	2.64	1.95	1.69	1.39	1.24	1.03
West Med.	2.83	2.92	2.55	2.52	2.31	2.19	2.18	2.16	2.56	2.38	2.41	2.38	2.20	2.17
SSB relative to 2003														
Cent.Med.	1	1.14	1.18	1.38	1.20	1.09	1.11	1.05	0.97	0.95	1.03	1.12	1.14	1.30
East Med.	1	1.16	1.31	1.29	1.21	1.14	1.23	1.00	0.84	0.99	1.21	2.13	2.25	2.20
West Med.	1	0.85	0.94	0.93	0.87	0.87	0.90	0.94	0.92	0.88	0.85	0.84	0.87	0.90

Strengths

An important achievement was the adoption in June 2019 of the first Mediterranean multiannual plan (MAP) concerning fisheries exploiting demersal stocks in the Western Mediterranean and establishing a reduction of a maximum of 40% of the fishing effort in 5 years, with a mandatory reduction of 10% in the first year of implementation of the plan (2020). The plan also provides that F*msy* should be achieved on a progressive, incremental basis by 2020 where possible, and by 1 January 2025 at the latest, and establishes fisheries closure areas. Effort reductions can be supplemented by technical or other conservation measures in order to reach F*msy*.

Taking into account the shared nature of most fish stocks, the EU promotes multilateral cooperation in the competent regional fisheries management organisations the General Fisheries Commission for the Mediterranean (GFCM) and the International Commission for the Conservation of Atlantic Tuna (ICCAT). An important milestone was the adoption of the MedFish4Ever declaration in 2017, which sets out a number of actions in order to rebuild Mediterranean fish stocks, protect the region's ecological and economic wealth and boost the sustainable development of aquaculture through a wide range of measures[97]. These commitments were renewed at the High-Level Conference held in Marrakech in June 2019.

An increasing number of conservation and management measures have been adopted by the GFCM in recent years. They include, *inter alia*, multiannual management plans (eel, red coral, demersal stocks in the Adriatic and the Strait of Sicily, deep-water shrimp in the Levant and the Ionian Seas) which contain a variety of measures such as establishing minimum sizes, catch limits, spatial and temporal closures, reduction of the fishing effort, and monitoring, control and surveillance measures, including the establishment of joint inspection schemes (Strait of Sicily) and pilot inspection projects (Adriatic, Ionian and Levantine Seas). Emergency measures for small pelagics in the Adriatic have been put in place, limiting catch levels and number of fishing days per year and establishing spatio-temporal closures. Management measures for blackspot seabream in the Alboran Sea have also been implemented, as well as measures for dolphinfish and red coral.

Challenges

The initiatives taken at regional level through the GFCM are only the beginning of a long process, and renewed efforts are needed. Going forward, with the EU's continued support, the GFCM will adopt its 2021-2025 Strategy which will give a renewed impetus to turn around fisheries governance in the Mediterranean, in particular with the adoption of new regional MAPs, improved control activities, expansion of FRAs, the protection of sensitive species and measures on fishing capacity.

Although there are signs of improvement, the biological resources in the sea basin are still heavily overexploited and the Mediterranean is facing significant challenges. Many stocks, including hake and Norway lobster, are declining in several geographical sub-areas and are overfished. Stocks of deep-water rose shrimp, sole, spot tail mantis shrimp and red mullet have increased in recent years, but fishing mortality is still above sustainable mortality levels. Although the European anchovy is not overfished in the Aegean Sea, small pelagic species (anchovies and sardines) show a negative trend in all the geographic sub-areas assessed. Even if bluefin tuna appears to be recovering, swordfish is overfished and the stock of Mediterranean albacore is also considered to be in a precarious state.

[97] Data collection and scientific evaluation; establishing an ecosystem-based fisheries management framework; developing a culture of compliance and eliminating illegal, unreported and unregulated fishing; supporting sustainable small-scale fisheries and aquaculture; and ensuring greater solidarity and coordination in the Mediterranean.

Many assessed stocks are considerably above the F*msy* target estimates. Overall, only 13% (6) of the assessed stocks are not overfished. They include red mullet in the South Tyrrhenian Sea, Adriatic Sea, and Aegean Sea along with deep-water rose shrimp in the Ligurian and North Tyrrhenian Seas and the common cuttlefish in the northern Adriatic.

With no species under TAC and quota other than swordfish and bluefin tuna, management effort is focused on the implementation of the technical measures laid down by EU law, by the GFCM and ICCAT and on the implementation of management measures, including management plans adopted at EU level, by Member States or by the GFCM. However, in line with the objective of the MedFish4Ever declaration and the GFCM mid-term strategy, further measures will need to be developed with the aim of reducing over-exploitation levels, including measures to fight against IUU (such as traceability schemes) and establishing a regional capacity plan ensuring a good balance between resources and fleet capacity of all Mediterranean riparian countries, including EU Member States.

Another challenge is the implementation of the Western Mediterranean MAP. From 2020, a total reduction of up to 40% of the fishing effort is to be achieved within 5 years, with a mandatory reduction of 10% in the first year of implementation (2020).

Recreational fisheries form an integral part of Mediterranean coastal life and communities, but they also have shown to be an important component of fishing mortality. Available data are limited, however, which results in a lack of estimates of catches for inclusion in stock assessment. This may lead to significant bias in the assessment results. These data limitations (see below for details) present a challenge to Mediterranean fisheries management.

2.2 Implementing the ecosystem-based approach to fisheries management

Strengths

The Mediterranean Regulation[98] applies an ecosystem approach to fisheries management through provisions on protected habitats[99]. It also contains provisions on the establishment of FRAs at both EU and national level.

The Western Mediterranean MAP introduced a closure area prohibiting trawlers from operating at less than six nautical miles from the coast and 100m depth for 3 months a year. It also anticipates the designation by 2021 of additional closure areas where there is evidence of a high concentration of juvenile fish and of spawning grounds of demersal stocks.

With the MedFish4Ever Declaration, Mediterranean coastal states have committed to developing an ecosystem-based approach to fisheries management at basin level. The GFCM has been promoting the establishment of FRAs in the Mediterranean (e.g. the Jabuka/Pomo Pit in the Adriatic), which are also part of EU legislation applicable in the Mediterranean[100]. The GFCM has also taken steps to map the measures applicable to FRAs and to reduce the risk of by-catches of cetaceans during fishing operations. It has also adopted measures to protect vulnerable marine ecosystems and to create encounter protocols for vulnerable marine

[98] Regulation (EC) No 1967/2006, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 1612/94.

[99] As regards protected species, the Mediterranean Regulation prohibits the deliberate catching, retention on board, transhipment or landing of marine species referred to in Annex IV to the 'Habitat Directive'. In order to protect habitats, the following prohibitions are introduced: fishing with trawl nets, dredges, purse seines, boat seines, shore seines or similar nets above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams; fishing with trawl nets, dredges, shore seines or similar nets above coralligenous habitats and maerl beds. This is complemented by a prohibition to use towed dredges and trawl net fisheries at depths beyond 1 000m (measure adopted by the GFCM and transposed into EU law).

[100] Regulation (EU) No 1343/2011, amending Council Regulation (EC) No 1967/2006.

ecosystems and sensitive species. These measures further protect these species and ecosystems from adverse effects of fishing activities.

Challenges

The MedFish4Ever Declaration introduces a commitment to further develop fisheries restricted and marine protected areas, ensuring effective protection of at least 10% of the Mediterranean Sea by 2020. Further efforts are necessary. To achieve results, it is necessary to encourage a better understanding of the state of play and implement effective control measures.

The Declaration also calls upon signatory parties to ensure adequate protection of vulnerable species and sensitive habitats, with a specific attention to cetaceans, turtles, seabirds, seagrass habitats and coralligenous and maerl beds. Scientific knowledge of sensitive species is poor in this area, as few targeted observer programmes have been established other than in Italy. However, various studies indicate high by-catches of turtles in longline fisheries. Interactions between bottlenose dolphins and gill-net fisheries are problematic both for the dolphins, who may become entangled and drown, and for the fishers, who may lose catch from their nets and have their nets damaged by the dolphins. Similarly, the abundance of common dolphins is believed to have decreased in the Mediterranean, where they are now relatively rare, and both common and striped dolphins are classed as vulnerable. The population of Balearic shearwater is considered to be critically endangered and at risk of extinction. Although the main threats to the population are land-based threats to landing sites, by-catches in longline fisheries are thought to occur and add to the pressures on this species. Mediterranean demersal fisheries also take a wide range of protected and endangered shark and ray species as by-catches.

According to the Technical Measures Regulation[101], Member States may submit joint recommendations for additional mitigation measures for the reduction of by-catches as a result of scientific evidence of negative impacts of fishing gear on sensitive species. Additional support will therefore be required in order to improve knowledge of by-catches of sensitive species, the areas and times they are caught and the gears with which they are caught. Support will also be needed to identify those cases where action is needed, either or both to identify modifications to fishing gears to reduce such by-catches, or to identify areas and seasons where special restrictions on fishing might be needed. In parallel with such developments, consultations with the fishing sector and outreach programmes will be needed. Action to mitigate the impact of fishing activities on vulnerable species should be identified in terms of data collection and reporting (see Section 2.4), management measures and control measures.

The effects of invasive species on the environment and on other species is not well known. More research, information and data are needed (see Section 2.4).

2.3 Eliminating discards and making the best use of unwanted catches

Strengths

In the Mediterranean Sea, the landing obligation applies to species subject to minimum conservation reference sizes. Its implementation has been made easier by adopting different discard plans for small pelagic and demersal stocks, establishing both high survivability and *de minimis* exemptions. The landings of fish below minimum conservation reference size that

[101] Regulation (EU) 2019/1241, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.

Member States reported for 2018 are generally low. The landed fish is mainly used for fish meal, pet food or as bait for pot fisheries.

Challenges

The elimination of discards in the Mediterranean Sea is challenging due to a number of factors. The fleet is mainly composed of small-scale vessels that land their catch in many ports spread out along the coast, different species are caught at the same time in highly varying quantities, and the cost of handling and storing unwanted catches appears to be increasing due to the small quantities of unwanted catch and the very large number of landing places. Support should therefore be considered to improve the management of unwanted catches. Better selectivity of fishing gears should be fostered with the ultimate objective of eliminating discards. Results from recent studies (Minouw[102], Discardless[103]) show that the use of more selective gears in almost all types of fisheries would have a positive impact on discards as well as reducing the fishing mortality of target stocks in commercial fisheries.

There are shortcomings in discard data from fishing vessels (see below). Improvements in reporting and subsequent data collection are necessary, as is appropriate mainstreaming of the results of research studies on discards.

As the above makes clear, avoiding unwanted catches and, where necessary, handling and finding market outlets for them – in particular of undersized fish – remains a challenge in the Mediterranean.

2.4 Ensuring coherence with environmental legislation

Strengths

The Mediterranean Sea is characterised by a unique, rich, yet fragile biodiversity, hosted by many diverse ecosystems across the region which together form an invaluable natural capital on which populations and economies depend. It is estimated that between 10 000 and 12 000 marine species thrive in the Mediterranean Sea. Around 20–30% of these species are endemic.

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

Other initiatives include the action plan for the conservation of the coralligenous and other calcareous bio-concretions in the Mediterranean Sea and the action plan for the conservation of habitats and species associated with seamounts, underwater caves and canyons, aphotic hard beds and chemo-synthetic phenomena in the Mediterranean Sea (the 'Dark Habitats Action Plan'). Under the GFCM, special efforts have been made to establish new FRAs, especially in the Adriatic with the most recent the Jabuka/Pomo Pit area.

[102] www.minouw-project.eu
[103] www.discardless.eu

Challenges

Mediterranean marine resources and ecosystems have come under increasing pressure in recent years, driven by diversification and intensification of marine and maritime activities. The basin's ecosystem is heavily affected by coastal development and sprawl driven by urban development and tourism, chemical contamination caused by pollution from human activity, nutrient overloading[104], the impact of marine litter, marine noise, invasive non-indigenous species, sea-floor integrity and over-exploitation. These factors contribute to changing hydrographic conditions, which impact the marine food web and degrade the basin's high biodiversity[105].

The Mediterranean basin has the lowest coverage of MPAs of any of the EU regional seas, with a total area coverage of 6.7%, including designated Natura 2000 areas[106]. When the Western Mediterranean is excluded, the other three sub-regions – the Ionian Sea and Central Mediterranean Sea, the Adriatic Sea and the Aegean-Levantine Sea – are among the least-covered sub-regions, with coverages of 3%, 5.8% and 2.6% respectively.

Marine litter is a significant problem, threatening Mediterranean wildlife such as sea turtles[107]. However, the information available for the Mediterranean Sea shows there is almost no information regarding seabed marine litter in the whole basin. There is some information regarding composition and abundance of beach marine litter, indicating the existence of monitoring and cleaning efforts, at least on the west part of the basin, but taking account of the international character of the basin, its vulnerability from an ecological point of view and the intensity of activities as fisheries and tourism, remediating action needs to be taken to collect information sufficient to allow the assessment of the environmental status (good environmental status under MSFD) of the different areas of the basin. Action should include targeted and continuous monitoring and cleaning frameworks, and action to prevent new marine litter on the Mediterranean coasts and seabed.

Although there has been increased interest by Member States in utilising EU funding support to involve the fishing industry in the reduction of marine litter, a lack of indicators, monitoring and evaluation has resulted in a lack of tools to evaluate the effectiveness and efficiency of actions against marine litter.

The Mediterranean Sea climate will undergo rapid changes over the next decades. Direct evidence of climate change is already being observed in the Mediterranean coast and in MPAs. The need to understand and work towards building resilience for both coastal communities and marine biodiversity to maintain and protect healthy ecosystems has become an essential element in mitigation against, and adaptation to, the rapid changes.

[104] Increased levels of elements such as nitrogen, phosphorus, silicon (and iron) in the marine environment.
[105] https://wedocs.unep.org/bitstream/handle/20.500.11822/364/sommcer_eng.pdf?sequence=4&isAllowed=y
[106] www.eea.europa.eu/publications/marine-protected-areas
[107] https://wedocs.unep.org/bitstream/handle/20.500.11822/364/sommcer_eng.pdf?sequence=4&isAllowed=y

Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas

Density of fishing-related seabed litter (number of items per km²) in the Mediterranean Sea per trawl, per year, obtained during monitoring surveys (data availability: 2007-2018)

Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas

Density of plastic bags-related seabed litter (number of items per km²) in the Mediterranean Sea per trawl, per year, obtained during monitoring serveys (data availability: 2007-2018)

3 Improving enforcement and control of fisheries and the provision of data

3.1 Collection of scientific data

Strengths

All Member States in the region have an institutionalised operational data collection management system. Completeness and quality of collected data are improving, especially as regards fisheries-dependent data. Tools to optimise the sampling of commercial fisheries and to quality check the data at national and regional level are now available for Member States to use. For fisheries-independent data, there are still some spatial and temporal gaps to be covered, but regional and international cooperation and harmonisation are in place as regards protocols, survey implementation and data management.

Despite some reported problems (e.g. lack of observer programmes and survey coverage, late start of data collection activities in certain cases, lack of harmonisation of age reading) the

Member States carried out data collection activities during the 2014-2020 EMFF period and have responded to data calls from scientific end users.

Stock assessment in the Mediterranean is carried out by two bodies, STECF and GFCM. The two processes are not aligned, but converging. The number of stocks assessed has increased considerably recently, but for other stocks, data are collected without the stocks being assessed or the data used.

Within the region, cooperation among Member States is mainly driven by the Regional Coordination Group (RCG) Mediterranean and Black Sea, which comprises 10 Member States (BG, EL, ES, FR, HR, IT, CY, MT, RO, SI) with the participation of the GFCM and JRC/STECF. Member States coordinate different fields: adjustments of data collection requirements, joint data collection methodologies and approaches to responding to data calls (enhancing consistency), cooperation on the scientific surveying activities of MS, improved quality checks by MS before uploading of data, regional database use, etc. Typically, and with the exception of stocks governed by ICCAT, fish stocks of the Mediterranean are mainly shared among a maximum of two or three EU countries (and, for a number of them, non-EU countries). This means that reaching an agreement among the Member States directly concerned – for sampling plans for stocks, for instance – may be more appropriate than overall Mediterranean regional approaches. In this way, regional sampling plans can be implemented through bi- or trilateral coordination without the need to include the whole sea basin.

Challenges

On average, problems with data delivery to end users occur more often in the Mediterranean than in other EU sea basins. This is partly due to past data deficiencies (that are repeatedly reported by end users), end-user feedback that is not informative enough to trigger action, and lack of communication between end users and relevant Member States. There is a need to streamline this process, in order to be able to react before an issue affects the scientific advisory process.

Sampling methods need to be further improved to live up to the ambition of the 2017 EU Data Collection Regulation[108]. This concerns in particular discarding, unwanted catches and incidental by-catch of listed prohibited and sensitive species as regards commercial fisheries. It also concerns small-scale fisheries, but progress is under way, as most of the Mediterranean Member States have now planned additional data collection of fishing activity variables which are not covered by a logbook obligation under the Control Regulation[109], to try to tackle the lack of data for the small-scale fleet segment.

Data collection based on pilot studies planned in the current EU MAP for recreational fisheries is also an issue, given the scale of recreational fisheries in this sea basin and the importance, therefore, of biological, effort and landings data to assess the impact of this activity on the stocks. Under the data collection framework, Member States have the opportunity to carry out pilot studies with the aim of updating the list of species for which they have to collect data. Five pilot studies were carried out by five Member States (IT, ES, EL, CY, MT), and 62 species were listed overall. A working group of the RCG Mediterranean and Black Sea will decide on a potential list of species by 2020 and the intention is to propose that Member States sample

[108] Regulation (EU) 2017/1004, repealing Council Regulation (EC) No 199/2008.

[109] Council Regulation (EC) No 1224/2009, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005, (EC) No 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006.

all species caught by recreational fishermen. This means that data collection will improve in the coming years.

The MARE/2016/22 STREAM project, commissioned for the whole of the Mediterranean EU waters and the Black Sea, has identified and proposed such sampling programmes for commercial fisheries, and proposed ways to improve data collection for small-scale and recreational fisheries. They need to be discussed among Member States, implemented and regionally coordinated in the near future. The RCG is expected to also tackle these challenges, and intersessional work is already underway.

The review of scientific surveys by the STECF showed that there are still temporal and spatial gaps in the current planning of surveys. In addition, delays in the timely implementation of research surveys have been a recurring issue. Age reading for a number of stocks needs further standardisation. There is still no regional database in the Mediterranean and Black Sea basins. There is a need to develop common validation tools and procedures to improve data quality, which is so far mainly dealt with at national level.

The MARE/2016/22 STREAM project also identified future training needs, including scaling up of expertise in modelling (stock assessment models), age reading, stomach analysis and identification of protected endangered and threatened species. Positive experiences from pilot studies developed by individual Member States in these fields also need to be integrated into the mainstream data collection activities, in particular under a new EU MAP for data collection.

Beyond the collection of data needed for fish stock assessment, to date very little usable data appear to have been collected on by-catches of birds, cetaceans and turtles (some information is available on by-catches of sharks). New obligations on data collection for sensitive species have been introduced in the Technical Measures Regulation which requires Member States to take the necessary steps to collect scientific data on incidental catches of sensitive species. In addition, recent GFCM recommendations request the monitoring of by-catches of sensitive species. Compliance with these requirements will take increased effort in terms of data collection, observer coverage and on-board electronic monitoring. Advice on sampling of by-catches of cetaceans has been provided by the STECF[110] and advice on sampling of all sensitive species is also available from ICES.

Continued data collection challenges are further coordinated improvement of quality checks (including the relation with a regional data base to be developed), training of national data collection staff, work on stakeholder buy-in (notably fishers, for the reliable filling out of the logbook), increasing coverage of trips by scientific observers aboard fishing vessels, improving the representativeness of sampling, avoiding data gaps that have a significant impact on stock assessment and management of the region, and timely implementation of scientific surveys at sea.

The challenge is further increased by the fact that, in the Mediterranean, scientific assessment is conducted by both the STECF and the GFCM. The sharing of data for scientific analysis and scientific advice for fisheries management still needs to be further improved between GFCM and STECF processes. Under national work plans, Member States are expected to set up and follow scientifically approved methodologies and procedures for the whole data cycle, from planning and collection of data to transmission to end users, until 2021. Work is under way to improve alignment of the methods and processes for data collection, submission and access under the EU framework and under the GFCM framework, and the EU data collection legislation provides for a framework to enable improvements. To that effect, cooperation

[110] Scientific, Technical and Economic Committee for Fisheries (STECF) – Review of the implementation of the EU regulation on the incidental catches of cetaceans (STECF-19-07).

among Member States through the RCG and the creation of a regional database is key; work on the latter is currently underway.

3.2 Enforcement and control

Strengths

The GFCM plays a central role in the conservation of fish stocks in the Mediterranean and takes steps to combat IUU fishing under the 2017 regional plan of action against IUU. International GFCM joint inspection schemes have been adopted, notably for the Strait of Sicily area. A pilot project towards the elaboration of a centralised VMS and control system which is supposed to facilitate the control of industrial and artisanal fisheries in the GFCM convention area is ongoing.

The European Fisheries Control Agency (EFCA) coordinates the implementation the Eastern Atlantic and Mediterranean Joint Deployment Plan (JDP), which also includes a bluefin tuna and swordfish component to comply with ICCAT measures. It also coordinates the international joint inspection and surveillance schemes in the Strait of Sicily, Adriatic Sea, Ionian Sea and Levantine Sea, implementing GFCM recommendations.

The European Commission and EU/EEA Members have also jointly developed a common information-sharing environment (CISE), with the support of relevant agencies such as the EFCA. It aims to integrate existing surveillance systems and networks and give all the authorities concerned access to the information they need for their missions at sea. The CISE aims to make different systems interoperable so that data and other information can be exchanged easily through the use of modern technologies.

Challenges

Since most species are not subject to TACs and quotas, the control challenges in the Mediterranean mainly concern the implementation of management plans established by the EU, the Member States and the GFCM as well as the implementation of technical measures established by the EU and ICCAT.

For example, considerable efforts are necessary to ensure compliance with the ICCAT provisions regarding bluefin tuna and swordfish and with the GFCM provisions on the fishing restricted areas (e.g. the Strait of Sicily). For bluefin tuna, considerable resources will be required to strengthen the control and traceability of activities in bluefin tuna farms within the framework of the newly adopted ICCAT Management Plan for bluefin tuna.

Another area of concern is the monitoring and control of the small-scale fleet, which is very important in the Mediterranean. To this end, it will be necessary to make investments in improved and innovative monitoring and reporting technology adapted to small-scale vessels. Similarly, the control and monitoring of recreational fisheries, including catch data reporting, must be strengthened.

While the landing obligation also applies in the Mediterranean, the control challenges are different to those in the other sea basins. The absence of TACs and quotas means that there is no need for fishers exploiting mixed fishery to discard any fish in order to comply with a vessel's available quota. On the other hand, the risk of landing undersized fish is considerable, especially considering that control of landings is a major challenge due to the high number of small-scale vessels and the numerous landing sites. Reinforcement of landing controls is necessary therefore, together with inspections at sea to verify the compliance of fishing gears used.

As in other sea basins, there is a need to carry out effective controls of engine power, either through physical verifications and/or by using modern technologies such as the installation of devices allowing a continuous monitoring of engine power.

Overall, a robust control framework must be implemented and the necessary human and technical resources must be made available to attain the above-mentioned objectives.

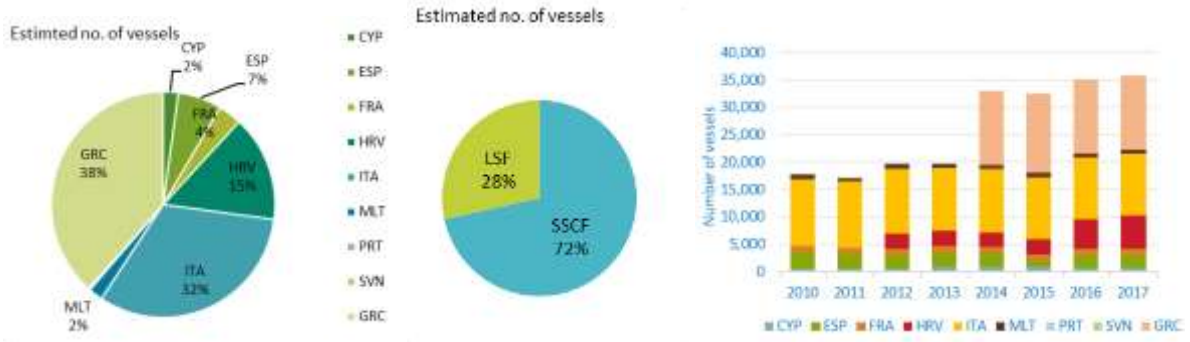
4. Ensuring a balanced socio-economic outlook for the fisheries sector

Although the Mediterranean region covers nine EU Member States, it is important to emphasise that Greece is not included in most of the analysis, because Greek data cover only the large-scale fleet for all economic variables and for the whole-fleet structural variables (number of vessels, energy consumption, number of jobs and FTEs).

Trends in the number of vessels have remained relatively stable since 2010. Increases in 2011 and 2014 correspond respectively to the entry of the Croatian fleet following the accession of Croatia to the EU and to the submission of Greek fleet data. The Mediterranean fishing fleet consisted of 35 738 active vessels, accounting for 43% of all EU vessels and for 36% of EU fisheries employment in 2017 (excluding Greece). It is characterised both by the importance of the Italian and Greek fleets (70% in total) and by a high level of SSCF (72% of the regional fleet; 28 817 vessels), 44% of which belongs to the Greek fishing fleet. The LSF consisted of 6 632 vessels in 2017, of which Italy, Spain, Croatia and Greece had the largest number of active vessels (3 901, 1 068, 967 and 447 respectively). The main LSF fleet segments are Italian demersal trawlers 12-18m, 18-24m and 24-40m and the Spanish demersal trawlers 24-40m, which together represented around 40% of total landings of the area and 10% of the total fleet. The number of LSF vessels decreased by 5% between 2016 and 2017.

Trends in the number of vessels for the fleets operating in the Mediterranean Sea

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[111]



Data source: Member State data submissions under the DCF 2018 Fleet Economic (MARE/A3/AC(2018))[112]

Share of Mediterranean Sea fleet capacity by MS and fishing activity, 2016

[111] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 172).

[112] Scientific, Technical and Economic Committee for Fisheries (STECF) – The 2018 Annual Economic Report on the EU Fishing Fleet (STECF-18-07). Publications Office of the European Union, Luxembourg, 2018, JRC112940, ISBN 978-92-79-79390-5, doi: 10.2760/56158 (p.163).

4.1. Providing conditions for an economically viable and competitive fishing sector

Strengths

Fishing effort began to decrease in 2012 and reached a 10-year low in 2017. Between 2016 and 2017, the number of days at sea decreased by 7%. The Italian fleet accounted for about 60% of the number of days, followed by Croatia and Spain (11%). Around 65% of days at sea were undertaken by small-scale coastal vessels using passive gears (excluding Greece) and 35% by large-scale fisheries (LSF), of which most were undertaken by the demersal fleet.

Effort reduction is not accompanied by a reduction in catches. Live weight and value of landings have both been constantly increasing since 2010. However, the Mediterranean fleet contributed only 6% of the total EU landings and to 19% of the total landed value. Economic performance is mostly driven by the large-scale fleets, which contributed 91% of the landed weight and 78% of the value of landings.

Trends in landings for fleets operating in the Mediterranean Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[113]

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[114]

Trends in fishing effort (in days at sea) - excluding Greece – for fleets operating in the Mediterranean Sea

Fuel consumption has decreased, despite a jump after 2014 resulting only from the inclusion of Greek data. Energy consumption fell by 6% in 2017 compared with 2016.

Labour productivity (GVA per FTE) has been significantly increasing since 2014 for large-scale and small-scale fisheries alike: about 14%, reaching EUR 36 260 and EUR 20 420, respectively. The two sectors have been following the same pattern since 2015 and so the gap between them is almost constant.

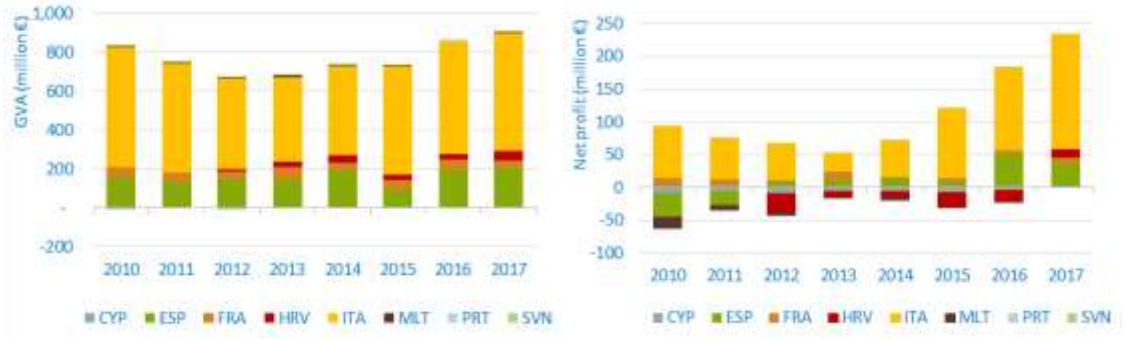
Trends in labour productivity by fishing activity for fleets operating in the Mediterranean Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[115]

[113] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 169).
[114] Footnote 113 (p. 172).
[115] Footnote 113 (p. 170).

Trends in energy consumption for fleets operating in the Mediterranean Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[116]

Reflecting the above trends, the Mediterranean fleet has improved all of its economic performance indicators since 2013, after several years of decline in GVA and even negative net profits. Indeed, GVA increased by 35% between 2013 and 2017 (from EUR 683 million to EUR 922 million), gross profit increased by 62% (from EUR 265 million to EUR 430 million) and net profit by 483% (from EUR 39 million to EUR 227 million). Revenue (income from landings and other income, excluding Greece) generated by the Mediterranean fleet increased by 5% (EUR 1.46 billion). All Member States saw their revenue growing, except Slovenia and Portugal, which suffered a decrease compared to the previous year. In particular, Cyprus saw an increase of 28%. Of the Mediterranean revenue, 98% was provided by four Member States: Italy (EUR 939 million), Spain (EUR 307 million), France (EUR 111 million) and Croatia (EUR 81 million).

In 2017 specifically, gross profit increased by 16% compared with 2016 (EUR 430 million) and net profit by 4% (EUR 227 million). In addition, the GVA-to-revenue as well as gross and net profit margins continued to improve, representing a 2%, 11% and 33% increase respectively relative to 2016. GVA and profits increased in all Member States, with the exception of Malta. The Italian fleet accounts for 64% of revenue and 74% of gross profit.



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Data source: MS data) submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015)[117]

Trends in profit (GVA and net profit) for fleets operating in the Mediterranean Sea

Challenges

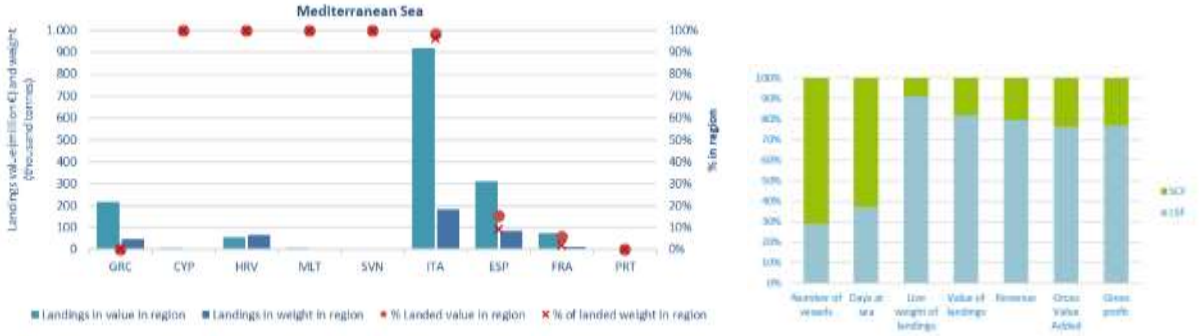
[116] Footnote 113 (p. 172).
[117] Footnote 113 (p. 176).

Most fleets are totally dependent on the Mediterranean basin for their primary fishery production. Almost all landings by the Cypriot, Croatian, Italian, Maltese and Slovenian fleets originated from the Mediterranean Sea. For Spain and France, however, the percentage of landings originating in Mediterranean waters is less than 10% and for Portugal the percentage is marginal.

In view of the alarming state of commercially exploited stocks, the implementation of strengthened management measures such as the EU MAP for the Western Mediterranean and multiannual management plans adopted at international level, with a corresponding reduction or limit in fishing effort, poses challenges in terms of adapting fishing fleets to fishing opportunities and maintaining the livelihood of fisheries-dependent coastal communities. These challenges will be compounded by the requirement to better align Member States' national management plans with the CFP objectives and by the already adopted and future measures to reduce fishing effort (e.g. existing and future GFCM multiannual management plans). In addition, other factors such as climate change and environment-related problems (marine litter, invasive species and pollution) also have an impact on the viability of the sector.

Share by fishing activity for fleets in the Mediterranean Sea, 2017

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[118]



Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019)); All monetary values have been adjusted for inflation; constant prices (2015).[119]

Importance of the Mediterranean Sea for fisheries in terms of landings in weight and value, 2017

4.2. Addressing overcapacity

Mediterranean - Active fleet segments out of balance					
Member States	**Total number of active fleet segments**	**Number of fleet segments assesssed**	**% of total value of landings assessed**	**Number of assessed fleet segments out of balance**	**% of assessed fleet segments out of balance**
FR	28	8	61%	4	50%
ES	30	14	76%	12	86%
HR	35	14	90%	13	93%
CY	7	2	25%	1	50%
EL	23	2	47%	1	50%
IT	25	15	59%	14	93%
MT	18	4	67%	3	75%
SI	14	1	1%	1	100%
Region Total	**180**	**60**	**-**	**49**	**82%**
EU Total	602	255	42%	190	75%

[118] Footnote 113 (p. 168).
[119] Footnote 113 (p. 168).

Source: Assessment of balanced indicators and review of national reports on Member States' efforts to achieve balance between fleet capacity and fishing opportunities (STECF-19-13). Note: this table covers all segments fishing in FAO 37. Assessment based on the sustainable harvest indicator.

Challenges

Fleet imbalance remains a significant issue in the region: 82% of the region's fleet segments assessed by STECF based on the sustainable harvest indicator are unbalanced.

Action plans were submitted by IT, ES, FR, HR, MT and SI.

The Italian annual fleet report and action plans are organised around assessments by geographical sub-area (GSA). While initially focused on the reduction of fishing capacity which was implemented by a scheme for decommissioning fishing vessels that ended in 2017, the plans drawn up since 2018 aim to achieve the objectives through the regulation of fishing effort, which, in addition to the usual temporary ban, establishes a further specific reduction percentage of fishing days for each GSA and length (LOA) class. In particular, for GSA 9, 10, 11 and 19 effort is to be reduced by 10%, GSA 16 by 6% and in GSA 17 and 18 by 8%, irrespective of vessel length. Additional temporary days of ban vary between 7 and 18 according to vessel length.

The Spanish action plan concludes that measures are required for trawlers of a length of less than 40 m, given their dependence on overexploited species, and that there is a necessity to ensure the recovery of a biological balance in the whole of the Mediterranean purse seiner fleet. Furthermore, the action plan signals that the current action plan for surface longliners needs to be continued. ES presents a wide range of measures to address imbalances, but without targets or timeframe.

The French action plan targets four segments. A reduction of one and two vessels will be implemented for demersal trawlers/seiners 18-24 m (currently 28 vessels) and those 24-40 m (currently 31 vessels) in length fishing for hake and red mullet. The segment of the smallest vessels catching eel will be reduced by 10 vessels (currently 193). Gangui vessels will be reduced by 5 vessels (currently 23 vessels). For the latter segment, fleet conversion is another possible measure.

The Croatian action plan targets purse seiners 12-18 m and 24-24 m in length and demersal trawlers/seiners of all lengths. The proposed measures for the latter segments include fishing effort restriction, temporary cessation, implementation of a new management plan, revision of licence authorisations, introduction of no-take zones and improvement in monitoring, surveillance and control. Action for the purse seine segments includes fishing effort limits (maximum of fishing days per vessel per year and month); spatial and temporal closures; limitation of overall fleet capacity of those fishing for small pelagic stocks and improvements in scientific surveys and stock assessment methodology.

The Maltese action plan contains weighing of fishery products on automatic weighing and labelling machines for all vessels below 12 metres; a sampling plan for all vessels below 12 metres; equipping of vessels ≥ 6 m and <12 m with a monitoring system; for drift/fixed netters, prohibition of fishing in bays and creeks from 15 February–30 August with all types of nets; for vessels fishing with pots/traps, a closed season for the months of April and May; and for the entire fleet, market analysis to identify any structural deficiencies or market forces resulting in a low average price at first sale for fishery products.

The Slovenian action plan targets three segments. For purse seiners, two main measures are used: temporary cessation and capping of days at sea. For drift/fixed netters smaller than 12m,

there will be a licence cap, i.e. an extension of the temporary non-issuing of licences for certain fishing gears to include drift and fixed nets.

For Greece, some of the measures in the 2016 action plan for the coastal fleet segment are continuing, after the implementation of the decommissioning scheme which substantially reduced fishing capacity in 2018, mainly by scrapping 647 fishing vessels of about 3 407.40 GT and 26 365.67 kW. A revised action plan is envisaged.

Cyprus did not submit any action plan as the fleet report does not provide any evidence to suggest imbalances in its fleet segments.

Mediterranean - Support to the permanent cessation under the EMFF						
Member State	**Number of vessels**	**Vessels - Share of EU total**	**Total eligible public cost committed**	**EMFF support committed**	**EMFF - Share of region's total**	**EMFF - Share of EU total**
CY	66	5%	2.955.481	1.486.490	2%	2%
EL	766	61%	46.029.264	23.014.632	36%	31%
HR	85	7%	15.688.234	7.844.177	12%	10%
IT	230	18%	62.022.504	31.011.252	49%	41%
Region Total	**1.147**	**91%**	**126.695.483**	**63.356.551**	**-**	**84%**
EU Total	1.260	-	148.925.930	75.256.543	-	-

Source: Commission communication on the State of Play of the Common Fisheries Policy and Consultation on the Fishing Opportunities for 2020 (COM(2019) 274 final)

4.3. Contributing to a fair standard of living for those who depend on fishing activities

Strengths

Total employment in the Mediterranean fishing fleet remained relatively stable in 2010-2016, but decreased by about 8% in 2017 when measured in full-time equivalents. It was then estimated at 68 688 jobs, corresponding to 51 172 FTEs. 55% of the FTE total is employed in the SSCF (41 599 jobs corresponding to 28 098 FTEs) which makes the average employment per vessel at about 1.4. In large-scale fisheries, the segments with the highest numbers of employees are the Italian demersal trawlers 12-18m and 18-24 m (3 381 and 2 472 respectively), reflecting the high number of active vessels in Italy, followed by the Spanish demersal trawlers 12-18m and the Greek purse seiners 18-24m.

The relative improvement in the economic indicators is reflected in the steady increase in wages in small-scale fisheries and large-scale fisheries alike. Since 2015, they have been following a similar increasing trend: SSCF average wages increased by 6.5% relative to 2016 and by 16.8% relative to 2015; LSF average wages increased by 6.8% and 11.5% respectively. On average, yearly wages in SSCF and LSF are about EUR 11 500 and EUR 15 000 respectively.

Trends in average wage by fishing activity
for fleets operating in the Mediterranean Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[120]

[120] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 170).

Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[121]

Trends in employment (in FTE) for the fleets operating in the Mediterranean Sea

Challenges

Small-scale fisheries represent 60% of all employment (55% of total FTEs) and over 70% of the fleet. There are 28 817 small-scale vessels with a combined gross tonnage of 32.5 thousand GT and a total power of 519 thousand kW. The main SSCF fleet segments are the Italian polyvalent passive gears below 6m LOA (2 193 vessels) and 6-12m (5 154 vessels), and the Croatian polyvalent passive gears below 6m LOA (2 786 vessels), which together accounted for 47% of the Mediterranean fleet (excluding Greece) in 2017.

The Mediterranean SSCF faces a particular situation. Although its economic performance has improved in recent years, overall revenue has remained stable since 2016. The sector recorded a GVA of around EUR 243 million, net profits of EUR 60 million and improving labour productivity. The highest net profit was generated by the Italian SSCF at EUR 41 700.

The Mediterranean SSCF can also count on its diversity, as it involves a large number of fishing techniques (static nets like trammel nets, gillnets, set longlines, pots, and traps) targeting a variety of species including common sole (mainly Croatia and Slovenia), common cuttlefish (mainly Italy, Croatia, Greece and Spain) and surmullet (mainly Cyprus, Greece, Italy, France, Malta and Spain). Other target species include common octopus (mainly Italy, Croatia, Greece, Spain, France and Malta) and European hake (mainly Italy, Croatia, Spain and France).

Overall, the SSCF benefits from a number of positive factors: higher revenues in most Member States and a higher value which reflects higher average prices linked to differences in quality, freshness, product size and the use of different marketing channels such as very short supply chains and new attractive ways to contact consumers.

On the other hand, although over 60% of the effort (fishing days) is deployed by the SSCF, these vessels land only 9% of the weight and 18% of the value in the region (excluding Greece). In addition, this fleet segment represents almost 55% of total fisheries employment in the Mediterranean Sea (excluding Greece) and most of them are family-based enterprises, with an average employment per vessel of 1.4 FTE, and ageing and less educated workers. This may make adaptation to the challenges facing fisheries in the Mediterranean more difficult. Two Member States, in particular, are major employers: Greece with 16 213 FTEs and Italy with 8 599. In some Member States (e.g. Greece and Cyprus), women play a key role, very often through the provision of unpaid labour.

[121] Footnote 120 (p. 172).

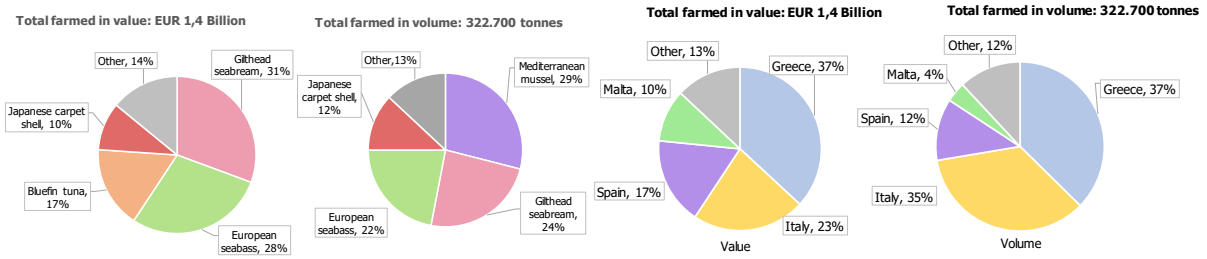
The capacities of the small-scale fisheries sector are limited in terms of human capital (ageing fishers, difficulty in attracting young people with a limited educational level, difficult working and safety conditions on board), investment and innovation. As a consequence, the sector has difficulties in meeting minimum compliance requirements regarding data collection, traceability and monitoring, control and surveillance measures.

Moreover, a number of problems impact the economic performance of small-scale fishers: competition with an increasing number of recreational fishers, who usually fish in coastal areas and sometimes illegally sell their catch at low prices, and conflict between the small-scale and large-scale fleets.

The relevance of the small-scale fisheries was acknowledged with the adoption, in the framework of the GFCM, of the Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and Black Seas (September 2018). It is an ambitious plan that aims to ensure the long-term environmental, economic and social sustainability of small-scale fisheries and sets forth specific actions to be implemented in the following areas: scientific research, collection of data, management measures, the value chain of small-scale fisheries, promoting the participation of small-scale fisheries in decision-making processes, improving capacity building, promoting decent work, promoting the role of women and addressing climate and environment.

5. Promoting a sustainable and profitable aquaculture

The Mediterranean region is the second most important aquaculture producer in the EU[122]. A diverse set of species is farmed: Mediterranean mussels, seabream, seabass, bluefin tuna, Japanese carpet shell. While Mediterranean mussels and seabream make more than half of the production in volume, the two most valuable species are seabream and seabass, followed by bluefin tuna. Greece and Italy dominate Mediterranean aquaculture with around 70% of the volume and value produced.



Strengths

In 2016[123], it was estimated that 16 000 FTEs were employed in the aquaculture sector in the Mediterranean Sea, corresponding to 36.5% of the total employment of EU aquaculture. The GVA of the Mediterranean aquaculture was €744 million.

Challenges

Among the main challenges in the region is access to space. Operators find it difficult to receive new licences or relocate existing farms due to the time-consuming licensing procedures, high tax costs and the pending designation of areas for aquaculture use. Moving farms to deeper waters is under assessment in some countries with more favourable physical and meteorological conditions (e.g. Cyprus, Malta). One of the priorities remains, therefore, the

[122] The data on production are extracted from the EUMOFA report, which includes the Mediterranean production of France as well as Bulgaria and Romania.
[123] Available data do not allow to present a trend over a multi-year period.

identification and mapping of the most suitable areas for expansion of aquaculture, as well as exploring new potential opportunities among the various marine uses (co-location, research on optimal sites including for the cultivation of different species). Promoting appropriate sustainable aquaculture production in wetlands could also serve to preserve these ecosystems, which mitigate coastal erosion due to climate change.

The turnover of marine aquaculture in the region has been increasing. However, competitiveness of small companies is hampered by the low level of innovation and renovation of aquaculture facilities, limited liaisons with research and innovation and low capacity of diversifying species. On the other hand, the development of open sea farms or other types of production with high added value (e.g. algae for pharmaceuticals) offers opportunities to increase the competitiveness and profitability of small companies. There is therefore a need to promote knowledge, innovation and technology transfers to the sector and to support species diversification, both in terms of adapting to climate change and increasing the differentiation and competitiveness of Mediterranean aquaculture.

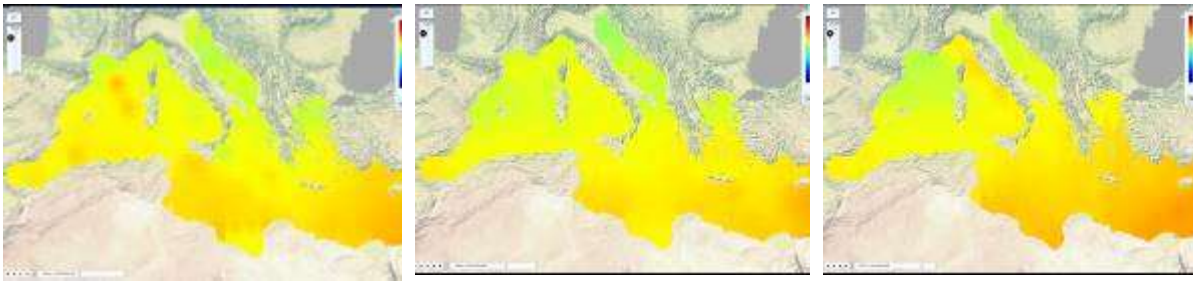
Other main issues for the region are: (i) climate change; (ii) fragmented, disorganised (and often non-existent) marketing strategies; (iii) low negotiating capacity of local farmers with large-scale retailers; (iv) lack of access to loans; and (v) lack of organisation of producers. The position of aquaculture farmers and the value chain of aquaculture products could be strengthened by supporting differentiation of products, creating additional producer organisations, and encouraging partnerships between producers, the processing industry and distribution and marketing chains. Taking steps to increase the social acceptability of aquaculture could also be encouraged. Finally, establishing transparent environmental monitoring plans and reporting and collection by competent authorities of data on environmental indicators of aquaculture activities is important to limit the reduction of the environmental footprint of aquaculture activities and increasing their social acceptance.

According to a 2018 report from the Commission[124], further efforts in terms of improving fish welfare standards for sea bass and sea bream are necessary, since OIE standards on animal welfare at time of slaughter are still not achieved.

6. Enabling climate change adaptation and mitigation

August 1995 August 2005 August 2015

[124] COM (2018) 87 (final).



January 1990 January 2000 January 2010

Data source & visualisation: EMODnet physics portal

Average Sea Surface Temperature (SST) for months January and August (1990 to 2015) for the Mediterranean Sea (analysis of in situ data)

The effect of the changes in sea temperature, which besides the increase in the average SST is also visible in the form of extreme phenomena, will inevitably influence all aspects of regional coastal and marine social-ecological systems, including blue economy sectors and adaptation/mitigation strategies. These phenomena can be more intense in the Mediterranean Sea, compared to other sea basins, due to its secluded character.

The Mediterranean Sea is one of the most vulnerable regions in the world to the impacts of global warming. The region has also been recognised by the oceanographic community as a natural laboratory for the study and analysis of climate change, as some of the main processes governing ocean circulation on a global scale are reproduced on a much smaller scale in the Mediterranean Sea. The need for multilateral cooperation and coordination among all the countries bordering the Mediterranean has long been recognised. This has resulted in the Mediterranean action plan (MAP), implemented by the Barcelona Convention, which promotes integrated coastal zone management as the most effective way to improve the ecological state of the sea and help coastal communities adapt to climate change. In addition, efforts are being made to design a climate change response in the area of fisheries, like the Forum on Fisheries Science in Mediterranean and Black Sea, the MedFish4Ever and Sofia Declarations and the regional plan of action for sustainable small-scale fisheries in the region. Further action building on stakeholder consultation and in cooperation with third parties in the region could focus on supporting innovation and scientific assessments for adapting fisheries management, and raising awareness through targeted communication campaigns and stakeholder engagement.

Fishing effort in the Mediterranean is a key management tool and is increasingly moving towards a significant reduction in effort (40% reduction in fishing effort under the Western Mediterranean MAP by 2025). This means that fuel burn, and therefore carbon emissions, will be significantly reduced as fishing mortality is brought into line with CFP objectives. Concomitantly, yields of food fish would increase substantially and would provide an important contribution to the EU's food security. In addition, further reductions in carbon emissions can be expected if more modern propulsion systems such as either hybrid-electric and/or diesel-LNG propulsion could be brought into general use.

7. Fostering the local development of a sustainable blue economy

The Mediterranean blue economy generated EUR 60 billion in GVA in 2017 and 1.78 million jobs. The key sector is clearly coastal tourism (EUR 34 billion in GVA and 1.26 million jobs) followed by maritime transport, living resources and port activities (with EUR 7 billion in GVA

each). With small variations, this general structure is also observed across the different sub-basins.

The European Commission[125] launched the initiative for the sustainable development of the blue economy in the Western Mediterranean (WestMED) in 2017. It involves 10 Western Mediterranean countries[126] (including five EU Member States), and its framework for action identifies 10 priorities such as promoting coastguard cooperation, maritime cluster development, green shipping, maritime spatial planning, blue skills or sustainable fisheries and coastal community development. Over the past 2 years, the initiative has translated into some 15 projects worth EUR 30 million[127]. WestMed also contributes to the implementation at sub-basin level of other wider Mediterranean initiatives, such as MedFish4Ever, the BLUEMED marine Strategic Research and Innovation Agenda and the Union for the Mediterranean ministerial declaration on blue economy.

Cooperation is also intense within the framework of the EU strategy for the Adriatic-Ionian region (EUSAIR)[128]. This macro-regional strategy was launched in 2014, based on the Adriatic-Ionian Initiative. It sets a framework for cooperation on blue growth, transport, energy, environmental quality and sustainable tourism between four EU Members and five non-EU countries at various stages of pre-accession.

The Mediterranean region can build on the experience of CLLD to foster the sustainable development of the blue economy at local level.

In 2014-2020, there are 122 FLAGs in the Mediterranean Sea area, covering on average 701 km² – by far the smallest compared to other sea basins – and a typical population of 95 660 people. The fisheries sector employs approximately 611 workers in each FLAG area, 59% in the catching sector and 24% in processing; aquaculture represents 18% of employment.

Receiving a typical EMFF contribution of EUR 1 306 665 in 2014-2020, these FLAGs have the median total budget of all sea basins of EUR 1 905 511. As with most FLAGs, their strategies focus on adding value to the local catches and on diversification outside the fisheries sector. Environment-related projects are also a higher priority than for the FLAGs of other sea basins.

Challenges in the Mediterranean Sea include:

- an ageing fishing sector workforce with a limited educational level;
- the dominance of tourism over other coastal uses and its potential disconnection from the territory (cruise tourism, non-local seafood, etc.);
- the lack of involvement of local communities (including SSCF) in ecosystems management;
- the existence of IUU activities;
- environmental issues such as acute human pressure on ecosystems;
- marine pollution and litter;
- growing pressure from climate change on coastal areas.

Lastly, some coastal areas faced strong migration pressure from non-EU countries.

[125] COM (2017) 183 (final).
[126] Algeria, France, Italy, Libya, Malta, Mauritania, Morocco, Spain, Portugal and Tunisia.
[127] www.westmed-initiative.eu
[128] www.adriatic-ionian.eu

Opportunities for FLAGs could include:

- the development of sustainable tourism (small-scale ecotourism products, labels promoting local food, etc.);
- the establishment of businesses based on blue biomass (seafood by-products, algae);
- connecting the aquaculture sector to research and innovation institutions;
- supporting the diversification of the aquaculture sector;
- supporting the development of participative resource management processes (co-management), including support for the development of MPAs.

MPAs are increasingly recognised as effective ecosystem-based management processes, and cooperation between FLAGs and MPAs should be fostered.

These FLAGs could address larger issues such as the collection of marine litter, the creation of infrastructure to mitigate the impact of climate change or produce energy locally, the promotion in common of new ecotourism products, and the organisation of training and capacity-building sessions to foster a 'business spirit' among fishermen and aquaculture producers and attract younger people to these professions. In those areas affected by a large inflow of migrants from non-EU countries, the FLAGs could help to find ways of helping the local population adjust to this challenge, which risks disrupting the local economic base.

BLACK SEA

1. Scope

The Black Sea region covers FAO fishing area 37.4. Two EU Member States, Bulgaria and Romania, are currently involved in the Black Sea fisheries. Both fleets operate in waters under their respective national jurisdiction, since there are no high seas in the Black Sea. The fishery resources of the Black Sea are shared by Bulgaria, Georgia, Romania, the Russian Federation, Ukraine and Turkey.

The Black Sea has very specific environmental conditions. Its only connection to world oceans is through the Istanbul strait, a 35 km natural channel that is as little as 40 m deep in places. This channel carries seawater to the Black Sea from the Mediterranean along the bottom layer, and returns a mixture of seawater and freshwater of twice this volume in the upper layer. Additionally, over 90% of the deeper water volume of the Black Sea consists of anoxic water, meaning that with the exception of a few anaerobic bacteria, marine life is absent at depths beyond 50–200m. The Black Sea covers 436 400 km^2 of surface and has a maximum depth of 2 km and a coastline of approximately 4 500 km.

2. Ensuring sustainable management of natural resources

The most important species caught by EU fleets (Bulgaria and Romania) operating in the Black Sea are rapana (56%), red mullet (13%), European sprat (11%) and turbot. In 2016, Bulgaria was responsible for 54% of the landings of EU fleets, and Romania for the remaining 46%. Two species are under TAC management: these are turbot at GFCM level, with an EU allocated quota divided equally between Bulgaria and Romania, and sprat managed under an EU autonomous quota.

2.1 Applying the precautionary approach and achieving maximum sustainable yield

Status of stocks in the Black Sea (source: STECF report 'Monitoring the performance of the CFP', STECF-Adhoc-19-01)

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
F/FMSY													
2.18	2.24	2.44	1.94	1.80	2.32	1.94	2.13	2.89	2.38	2.57	2.13	2.80	2.53
SSB relative to 2003													
1	0.92	0.81	0.94	1.10	1.09	1.06	0.94	0.87	0.80	0.81	0.84	0.88	0.88

Strengths

Most of the fish stocks in the Black Sea are shared. It is therefore important to ensure that all riparian countries deploy joint efforts to ensure the environmental, economic and social sustainability of fisheries and thus a new fisheries governance in the Black Sea. To this end, the Sofia Ministerial Declaration adopted in 2018 established a specific plan of action for fisheries sustainability. The plan contains measures aiming to enhance data collection and scientific evaluation, establish ecosystem-based fisheries management, develop a culture of compliance and elimination of IUU, support sustainable small-scale fisheries and aquaculture and ensure greater solidarity and coordination in the Black Sea. The GFCM is the main vehicle for the implementation of the Sofia Declaration. In addition, The BlackSea4Fish project[129] has contributed to better science, improved dissemination of knowledge on small-scale fisheries, boosted the fight against IUU and created a by-catch monitoring programme. The implementation of the action set out in the Sofia Declaration is being monitored. The GFCM Georgia High Level Conference, initially planned on October 2020 and postponed in 2021 due to COVID-19 restrictions, will take stock of the progress made on delivering the objectives set by the Declaration and will renew the political commitments to joint work at sub-regional level while maintaining the momentum of the new fisheries governance in the Black Sea.

The GFCM adopted important measures for turbot by establishing a multiannual management plan which sets up a total allowable catch and an allocation of quota among riparian contracting parties up until 2022. The plan aims to maintain fishing mortality of turbot within agreed precautionary reference points, to achieve or maintain fishing mortality at MSY. It also established fleet management measures, limitation of fishing effort, spatio-temporal closure and monitoring, control and surveillance measures and a set of measures to prevent, deter and eliminate IUU fishing, including a joint control and inspection pilot project.

Challenges

The initiatives taken at regional level through the GFCM are only the beginning of a long process, and renewed efforts are needed. Going forward, with the EU's continued support, the GFCM will adopt its 2021-2025 strategy which will give renewed impetus to turning around fisheries governance in the Black Sea, in particular with the adoption of new regional MAPs, increased control activities and measures on fishing capacity.

Turbot, one of the key commercial stocks, is considered to be overexploited, although there are signs of improvement. Rapana is fluctuating around MSY and the status of sprat is uncertain. A roadmap of concrete future action to improve data quality, and thus the provision of scientific advice to support management decisions on stocks within the GFCM, has been established by the Working Group on the Black Sea, in line with the Sofia Declaration.

The Sofia Declaration calls for the expansion of existing management measures to progressively achieve exploitation at MSY, including through establishing multiannual management plans for key fisheries based on an ecosystem approach. The Declaration also calls for a regional capacity plan that ensures an appropriate balance between resources and the fleet capacity of all Black Sea riparian countries.

[129] www.fao.org/gfcm/activities/fisheries/blacksea4fish/en/

Recreational fisheries form an important part of the Black Sea coastal life and communities, yet available data for them are limited. Recreational fishing has been an important component affecting the status of stocks. A lack of estimates of catches for inclusion in stock assessment may lead to significant bias in the assessment results. These data limitations (see below for details) present a challenge to Black Sea fisheries management.

The Commission is basing further advances and future work at sub-regional level on the factors mentioned above, including the establishment of multiannual management plans for key fisheries such as sprat, piked dogfish and rapana if appropriate, development of fishing capacity plans, establishment of frameworks to regulate recreational fisheries, and the development of monitoring, control and traceability measures to complement and enhance effectiveness of management and conservation measures. GFCM work related to Black Sea countries' pilot studies on recreational fisheries will be taken into consideration.

Furthermore, the alignment of national management plans with CFP objectives is a key target.

2.2 Implementing the ecosystem-based approach to fisheries management

Strengths

Based on the ecosystem approach, the GFCM has adopted a multiannual management plan for turbot (see above) and a regional research programme for rapa whelk, which has progressively invaded the Black Sea over recent decades while its commercial importance has been increasing. It has also adopted measures intended to reduce the risk of by-catches of cetaceans during fishing operations.

Challenges

The Sofia Declaration calls for the protection of vulnerable species and sensitive habitats, with specific attention to cetaceans, seabirds and seagrass habitats, and for the development of fisheries protected areas and marine protected areas ensuring an effective protection of at least 10% of the Black Sea. Appropriate measures should be developed to achieve this objective. However, knowledge of by-catches of sensitive species is poor and largely anecdotal. Populations of common and bottlenose dolphins and harbour porpoises exist in the Black Sea, and these are classified as endangered. Monk seals were abundant but are now extinct. Sturgeon, resident particularly in the estuary of the Danube and nearby, is critically endangered. Overall there is a major need for improved reporting of by-catches (see below) and, if appropriate, follow-up work on by-catch mitigation measures, including both technical measures to adapt fishing gear and fishing practices.

The effects of invasive species on the environment and on other species are not well known. More research, information and data are needed (see below).

The Commission is basing further advances and future work at sub-regional level on the factors mentioned above, to complement conservation measures for sensitive species established at national, regional and international level, improve data collection and scientific knowledge of by-catches and mitigation measures of sensitive species such as sturgeon, sharks and cetaceans. GFCM and BlackSea4Fish project work related to by-catch monitoring programmes in the Black Sea will be taken into consideration.

2.3 Eliminating discards and making the best use of unwanted catches

Strengths

At regional level, efforts to improve data collection have been improved, and pilot studies are being carried out by the GFCM.

Challenges

The use of more selective gears in almost all types of fisheries would have a positive impact in reducing discards and fishing mortality of target stocks in commercial fisheries. More focus should be given to improving the selectivity of fishing gear.

Improvements in reporting and data collection are necessary (see below). To handle unwanted catches, port infrastructure should be developed and improved, as should equipment on board fishing vessels. Finding market outlets for those catches remains another challenge.

2.4 Ensuring coherence with environmental legislation

Strengths

The Black Sea basin has a moderate coverage of MPAs compared to other EU regional sea basins, with a total area coverage of 14.2%, including designated Natura 2000 areas[130]. It ranks below the Greater North Sea, the Baltic and the Western Mediterranean. It has the same percentage coverage as the Celtic Sea. It is to be noted that the extent of MPA coverage increased significantly between 2012 and 2016, from 4.5% to 14.2%.

Challenges

The environmental changes that have occurred in the Black Sea ecosystem in the past 50 years indicate its vulnerability to anthropogenic effects, nutrient pollution, persistent organic pollutants, climate change and invasive species, mainly due to the huge catchment area of the Black Sea and its almost landlocked nature. Black Sea habitats are impacted by human activities such as pollution inputs from agriculture and industry, oil spills and irresponsible fishing practices. Key pressures include nutrient overloading[131], which has decreased but remains a problem, algae blooms, which are still heavy, and pollution, which although localised continues to affect biological communities.

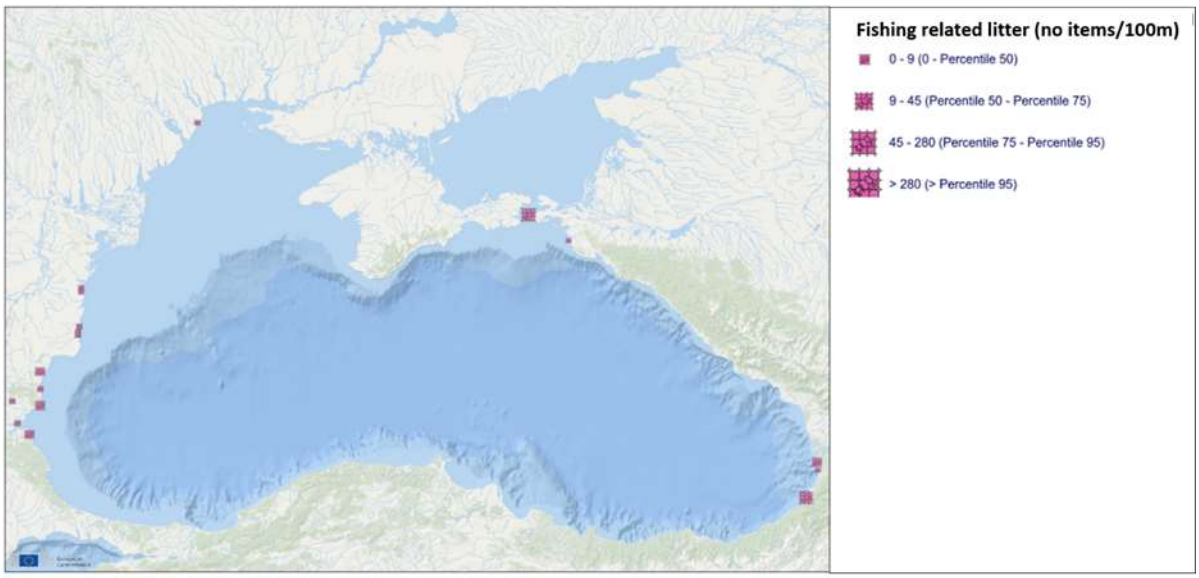
Furthermore, the unplanned development of coastal zones, intense maritime traffic, pollution and irresponsible fishing behaviour (particularly IUU fishing) have resulted in changes in the state of fishing resources in terms of abundance and distribution of commercial species. Apex pelagic predators have shown a significant decline, while anchovy, a key species in the ecosystem and the stock that sustains the region's largest commercial fishery, collapsed in the late 1980s and has displayed abrupt fluctuations since then. Small-scale fishing is predominant (91% of the overall Black Sea fleet) and plays an important role in providing income and ensuring food security, particularly within economically vulnerable coastal communities in the Black Sea.

Although recent regional efforts have resulted in improvements in the overall state of the ecosystem, these improvements are considered to be still in early and precarious stages[132].

Marine litter is a problem in the Black Sea as elsewhere[133], but there is very limited information on the composition and abundance of beach marine litter around the Black Sea. No official information is available on the abundance of seabed marine litter in the region. This lack of data is an obstacle to any official assessment of the environmental status needed to meet the requirements of the Marine Strategy Framework Directive, and also for the assessment of the impact of seabed marine litter on the fragile marine biodiversity of the region. Taking into consideration the international character of the basin, its ecological vulnerability and the

[130] www.eea.europa.eu/publications/marine-protected-areas
[131] Increased levels of elements such as nitrogen, phosphorus, silicon (and iron) in the marine environment.
[132] www.blacksea-commission.org
[133] www.blacksea-commission.org/_publ-ML.asp

intensity of activities as fisheries, navigation and tourism, remediating action is needed to collect adequate information for the different areas of the basin. Action should include concise and continuous monitoring and cleaning frameworks, as well as preventing new marine litter on the Black Sea coasts and seabed.



Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas

Abundance of fishing-related beach litter (number of items per 100 m beach) in the Black Sea per year, obtained during monitoring surveys (data availability: 2001-2018)

Data source: EMODnet chemistry portal / Visualisation: European Atlas of the Seas

Abundance of plastic bags related-beach litter (number of items per 100 m beach) in the Black Sea per year, obtained during monitoring surveys (data availability: 2001-2018)

3. Improving enforcement and control of fisheries and the provision of data

3.1 Collection of scientific data

Strengths

Data collection and scientific research, designed to improve the scientific advice, have been significantly improved in the recent years at regional level through the Regional Coordination Group Med & Black Sea (for data collection) and the GFCM BlackSea4Fish project. In order to ensure sufficient scientific data for the assessment of commercially important species, fishery-independent, pelagic and demersal surveys are carried out by Bulgaria and Romania twice yearly (in spring and autumn) and scientists from both countries actively participate in the relevant stock assessment meetings. Scientists from both Member States also attend the coordination meetings of similar Mediterranean surveys (MEDITS and MEDIAS), thus further strengthening the cooperation between the two basins. The GFCM BlackSea4Fish project carried out a much-needed regional acoustic pelagic survey in 2019 (with the participation of scientists from all Black Sea countries), and a regional demersal survey is planned in 2020 (initially planned in summer, delays due to covid-19 occur).

Challenges

There are gaps in the scientific knowledge and information on many processes and phenomena that are needed for policy and decision-making. Data collection and control remain an issue, with lack of data a key problem. There is a lack of expertise on modelling and the use of tools for sampling and data management. Cooperation between Bulgaria and Romania has improved over recent years (especially on surveys) but there is a need for further alignment of data collection activities for commercial fisheries, in particular small-scale fisheries. The experience of scientific observers on board fishing vessels, and their coverage, needs to improve. The most recent RCG meeting in 2019 stressed the need to expand MEDIAS (acoustic surveys targeting small pelagics) to the Black Sea.

As most of the fleet is small-scale, derogations for small-scale fishing significantly affect data collection. Similarly, data collection based on pilot studies in the current EU MAP for recreational fisheries is also an issue, given the importance of biological, effort and landings data for assessing the impact of this activity on the stocks. Under the data collection framework, Member States were given the opportunity to carry out pilot studies with the aim of updating the list of species for which they have to collect data. Such pilot studies will be carried out in the Black Sea in 2020-2021, based on approved work plans that follow relevant RCG recommendations.

New obligations on data collection for sensitive species have been introduced in the Technical Measures Regulation, which requires Member States to take the necessary steps to collect scientific data on incidental catches of sensitive species. In addition, recent GFCM recommendations request the monitoring of by-catches of sensitive species. Compliance with these requirements implies an increased effort of data collection, observer coverage and on-board electronic monitoring. Advice on sampling of by-catches of cetaceans has been provided by the STECF and advice on sampling of all sensitive species is also available from ICES.

The lack of expertise as regards modelling and data management is also widespread at sub-regional level. In order to overcome the data gaps and harmonisation required for more accurate stock assessment of Black Sea priority species, the GFCM BlackSea4Fish project contributes to data preparation exercises, benchmark stock assessments, research plans such as rapana,

specific workshops such as age-reading, training and capacity building activities for Black Sea scientists and surveys at sea.

3.2 Enforcement and control

Strengths

Since 2010, Bulgaria and Romania have been asked to prepare annual plans for monitoring and control of turbot fisheries. Both Member States have made significant efforts and have shown improvements, especially by undertaking joint control actions in cooperation with EFCA, which coordinates the implementation of the Black Sea Joint Deployment Programme (JDP) and the GFCM Black Sea pilot project on joint inspection, implementing GFCM recommendations.

The latter is an international pilot project launched in 2018 aiming to establish a voluntary observation and inspection programme in order to ensure compliance with the conservation and management measures for turbot set in the recommendation GFCM/41/2017/4. The joint operation took place in April 2018 with the participation of inspectors from Bulgaria, Romania, Ukraine and Georgia, under the coordination of EFCA. Turkey participated in a capacity-building activity. In 2019, the adoption of the revision of the turbot multiannual management plan paved the way for the establishment of concrete and, for this sub-region advanced, traceability measures, particularly the development and implementation of the GFCM Catch Certification Scheme for turbot catches, supporting the MCS measures in place and the fight against IUU fishing.

Challenges

While improvements are underway through action plans adopted by the Commission under the Control Regulation, it should be noted that both Black Sea Member States currently lack a well-functioning basic control structure. Most importantly, there is a need to increase control resources (e.g. fisheries inspectors, patrol vessels, etc.) and put in place reliable electronic catch reporting. Furthermore, the port infrastructure must be modernised, as it currently lacks landing sites that facilitate control and inspection.

Like in the Mediterranean, one of the control challenges in the Black Sea is to ensure that fishing activities comply with GFCM recommendations. As concerns the landing obligation, the situation is similar to that in the Mediterranean: low incentives for discarding at sea but high risk of landing undersized fish. There is also a need to strengthen the control and monitoring of the small-scale fleet and of recreational fisheries, including catch reporting. Finally, more needs to be done to carry out effective inspections of engine power, either by carrying out physical verifications and/or by use of to modern technologies such as the installation of devices allowing a continuous monitoring of engine power.

The fight against IUU is one of the objectives of the Sofia Declaration, which calls for a reinforced strategy to eliminate illegal fishing activities in the Black Sea. An appropriate framework and the necessary human and technical capabilities must be developed to attain that goal. The fight against IUU could also be stepped up through the development of traceability schemes.

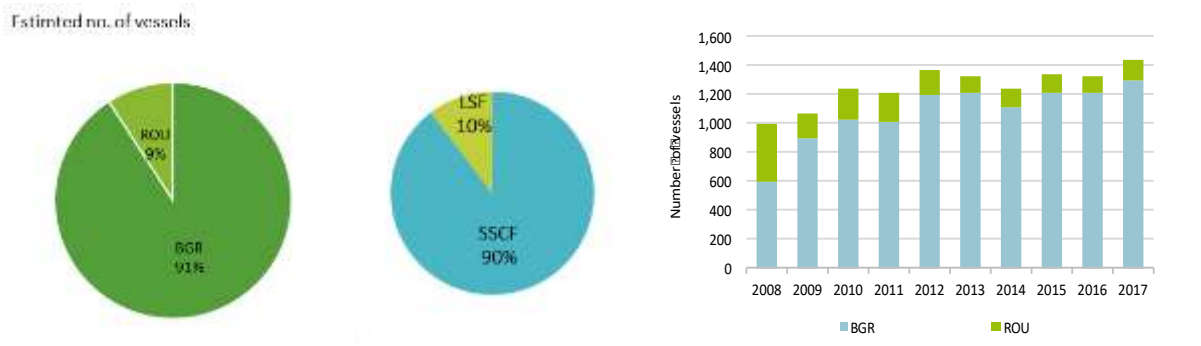
The European Commission and EU/EEA Member States have also jointly developed a common information-sharing environment (CISE), with the support of relevant agencies such as the European Fisheries Control Agency. It aims to integrate existing surveillance systems and networks and give all the authorities concerned access to the information they need for their missions at sea. The CISE aims to make different systems interoperable so that data and other information can be exchanged easily through the use of modern technologies.

4. Ensuring a balanced socio-economic outlook for the fisheries sector

Both fleets present in the Black Sea operate mainly in waters under their respective national jurisdictions. All landings originate from the Black Sea. The Black Sea fleet consisted of 1 430 active vessels in 2017. The Bulgarian fleet made up 91% of the total, with 1 295 vessels. The number of vessels has tended to increase since 2008, the lowest number of vessels having been registered in 2008 and the highest in 2017.

The small-scale fleet represented around 90% of the regional fleet (1 302 vessels). This ratio was stable over the period 2008-2017. In 2017, the large-scale fleet consisted of 128 vessels (9% of the entire fleet), of which Bulgaria had 81% (104 vessels; Romania: 24 vessels). The main gears used were pelagic trawls.

Trends in the number of vessels for the fleets operating in the Black Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[134]



Share of Black Sea fleet capacity by MS and fishing activity, 2016
Data source: Member State data submissions under the DCF 2018 Fleet Economic (MARE/A3/AC(2018))[135]

4.1 Providing conditions for an economically viable and competitive fishing sector

Strengths

Along with the increase in the number of vessels since 2008, the fishing effort (number of days at sea) also increased by 25% during the same period. It was stable in 2010-2014 but there was a gradual increase in 2015 and 2016, stabilised in 2017, which can be explained by the growing interest in harvesting sea snails. The Bulgarian fleet accounted for 84% of the effort. While Bulgarian days at sea fell by 800 between 2016 and 2017, the effort of the Romanian fleet increased by 766 days. The SSCF accounted for 68% of the effort. Over 2011- 2017, 30-37% of the total days at sea came from the LSF, with fluctuations over the past 3 years (increase from 6 3000 days to 10 400 in 2016 and decrease to 9 559 in 2017). The LSF targets the same species as the SSCF, with rapana making up the highest proportion (in value) for both fleets. Other important species for the LSF were European sprat, turbot, European anchovy and red mullet.

The increase in the number of days at sea in 2014-2016 is reflected into a gradual growth in live weight of landings during the same period. The weight and value of landings generated by the Black Sea regional fleet in 2016 amounted to approximately 17 000 tonnes and EUR 9.22

[134] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 190).
[135] Footnote 134 (p. 187).

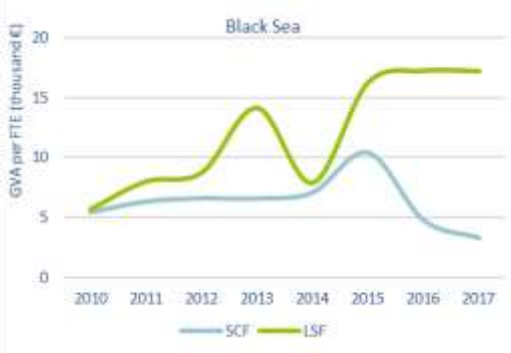
million. Despite no increase in effort, the live weight of landings and the value increased in 2017. This might be explained by the fact that vessels targeted species not so commercially important, and concentrated their effort on the rapana fishery.

Large-scale vessels accounted for 73% of all landings by weight, equivalent to 70% of the landed value. Although over 68% of the effort was deployed by the SSCF, these vessels landed only 27% in weight and 30% in value. The top 5 fleet segments (4 LSF segments and 1 SSCF segment) operating in the Black Sea (out of 20 active fleet clustered segments) represented only 11% of the total number of vessels, but they generated 77% of the landed weight, 72% of the landed value and 70% of the revenue. On the other hand, 5 other segments, all of them from the SSCF and with the largest number of vessels (70% of the active fleet – 995 vessels) and of jobs (1 403, or 413 FTEs), spent almost half of the total days at sea but landed only 8% of the weight and 9% of the value.

Trends in landings for fleets operating in the Black Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[136]

Trends in fishing effort (in days at sea) for fleets operating in the Black Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[137]

Labour productivity (GVA/FTE) shows a very different pattern according to fleet segment, although an overall increasing trend took place between 2010 and 2017 (from the minimum of EUR 5 901 per FTE in 2010 to EUR 8 015 per FTE in 2017). After a fluctuation between 2012 and 2015 it has remained stable for the LSF in the past 3 years, reaching EUR 17 193 in 2016, the highest value in 2008-2017. The situation for the SSCF is totally different: labour productivity decreased by 31% from 2016 to 2017, to reach its lowest value since 2010 at just EUR 3 276.

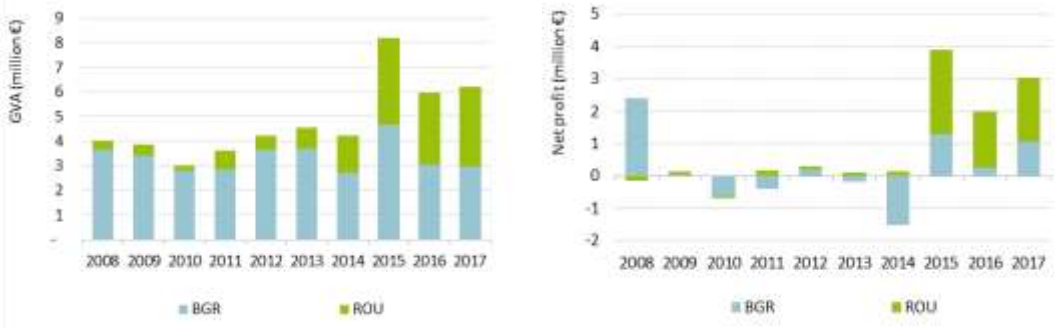


[136] Footnote 134 (p. 187).
[137] Footnote 134 (p. 191).

Trends in average labour productivity by fishing activity for fleets operating in the Black Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[138]

The overall economic performance of the Black Sea fleet reflects the trends presented above. It is notable that profits multiplied more than tenfold between 2010 and 2017 (from EUR 0.35 million in 2010). Although there was a small decrease in both gross and net profits in 2016 and comparable results in 2017, the revenue (income from landings and other income) generated in 2017 was estimated at EUR 9.6 million, increasing by 4% compared to 2016 and representing 19% more than the average for 2008-2016. This may be explained by a small increase in the average prices of some of the species with significant landings, and by stable average prices for the other species. 53% of the 2017 revenue was generated by the Bulgarian fleet (EUR 5 million). Similarly, GVA was estimated at EUR 6.2 million, representing an increase of 4% compared to 2016, and was 34% higher than the average in 2008-2016. GVA was almost equally produced by the Romanian and Bulgarian fleets (EUR 3.2 million and EUR 3 million, respectively). After accounting for all operating costs, the fleets operating in the region made EUR 3.9 million in gross profit, an estimated 7% increase on 2016. The Romanian fleet generated the largest gross profit in 2017, amounting to EUR 2.4 million (Bulgaria: EUR 1.4 million). Overall, the net profit amounted to EUR 3 million in 2017, a 47% increase from the EUR 2.1 million recorded in 2016 and a significant improvement from the net loss of EUR 0.58 million recorded in 2010.

The LSF segments are profitable. They generated EUR 4.5 million in GVA, a net profit of EUR 2.8 million and gross profit margins estimated at 59.1% for the Romanian LSF and 44.8% for the Bulgarian LSF. The situation varies more sharply in the SSCF: the Romanian fleet is profitable (44.8% gross profit margin, 40.5% of net profit margin) whereas the Bulgarian SSCF generated a negative gross profit margin (-21%) and a negative net profit margin (-32.4%).



Trends in profit (GVA and net profit) by fleets operating in the Black Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[139]

Challenges

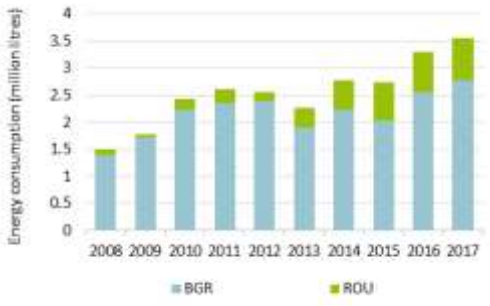
The Black Sea fishery is highly dependent on very few species, and some of the commercially important stocks are currently being exploited above FMSY. The GFCM has established a set of emergency measures for stocks in the Black Sea region in order to align the implementation of management measures by all countries operating in the region.

Pelagic trawlers consumed 1.4 million litres of fuel, a similar amount as the energy consumed by polyvalent vessels (1.5 million litres). However, pelagic trawlers consumed more energy

[138] Footnote 134 (p. 188).
[139] Footnote 134 (p. 193).

per tonne landed (368 litres/tonne on average compared to 153 litres/tonne for polyvalent vessels). As trawling is typically fuel-intensive, fluctuations in fuel consumption and increases in fuel prices may lead to a significant increase in energy costs. In 2017, the average price of oil was EUR 0.39 per litre; oil prices increased to an average of EUR 0.49 per litre in 2018, and remained at that level in the first nine months of 2019.

There may also be possible impacts of inland fisheries that could operate in coastal waters (Danube River Delta) on the social, economic and environmental sustainability of Black Sea marine stocks and coastal communities.



Trends in energy consumption for fleets operating in the Black Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[140]

The trends in the status of commercially exploited stocks, the levels of IUU fishing in the area, the implementation of strengthened management measures such as the GFCM measures and upcoming actions set out in the Sofia Declaration, the level of the SSCF and the dependency of fleets on a few profit-generating stocks (e.g. turbot, rapana) all pose challenges in terms of adapting fishing fleets to fishing opportunities and maintaining the livelihood of fisheries-dependent coastal communities. In addition, other factors such as climate change and environmental problems such as marine litter, invasive species and pollution also have an impact on the viability of the sector.

4.2 Addressing overcapacity

Black Sea - Active fleet segments out of balance

Member States	Total number of active fleet segments	Number of fleet segments assesssed	% of total value of landings assessed	Number of assessed fleet segments out of balance	% of assessed fleet segments out of balance
BG	25	25	100%	25	100%
RO	6	6	100%	6	100%
Region Total	**31**	**31**	**-**	**31**	**100%**
EU Total	602	255	42%	190	75%

Source: Assessment of balanced indicators and review of national reports on Member States' efforts to achieve balance between fleet capacity and fishing opportunities (STECF-19-13). Assessment based on the sustainable harvest indicator.

Challenges

[140] Footnote 134 (p. 191).

Fleet imbalance is a significant issue for the region, with all active segments considered to be out of balance based upon STECF's assessment of the sustainable harvest indicator.

The Bulgarian action plan provides measures for 10 segments[141]. The measures are described in general terms, and mostly relate to EMFF-supported projects. They are improvement of management of the fishing fleet, promotion of investments that add value to fisheries products, conservation and restoration of aquatic biodiversity and aquatic ecosystems, improvement of the competitiveness and viability of enterprises, and improvement of market organisation, including preparation and implementation of the production and marketing plans of producer organisations.

The Romanian action plan targets four fleet segments (PG 0006 and PG 0612, PMP0612 and PMP 1218). Measures comprise issuing fishing authorisations aimed at increasing the catches of other live marine resources (such as molluscs or vongole) in order to reduce the pressure on fish stocks, increasing the number of fishing days deployed, strengthening the control of temporary cessation of fishing activities for demersal species catches (turbot and picked dogfish), increasing selectivity, and strengthening relations between scientists and fishermen.

Black Sea - Support to the permanent cessation under the EMFF

Member State	Number of vessels	Vessels - Share of EU total	Total eligible public cost committed	EMFF support committed	EMFF - Share of region's total	EMFF - Share of EU total
BG	8	1%	247.046	123.524	100%	0,2%
Region Total	**8**	**1%**	**247.046**	**123.524**	**-**	**0%**
EU Total	1.260	-	148.925.930	75.256.543	-	-

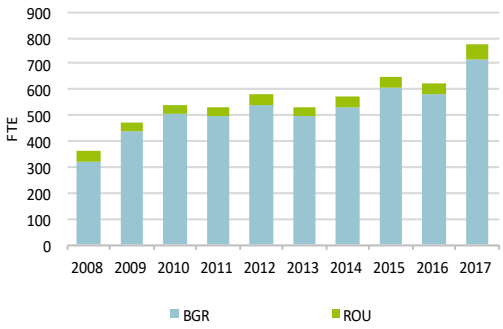
Source: Commission communication on the State of Play of the Common Fisheries Policy and Consultation on the Fishing Opportunities for 2020 (COM(2019) 274 final)

4.3 Contributing to a fair standard of living for those who depend on fishing activities

Strengths

Total employment in the fisheries sector has steadily increased during 2008-2007, with a small decrease only in 2013. The increase in employment in the Bulgarian fleet might be explained by an increase in active SSCF vessels and a slight increase in wages and salaries. Total employment in 2017 was estimated at 2 353 jobs, corresponding to 776 FTEs. The SSCF accounts for almost 84% of the total employment (1 967 in 2017) and 66% of FTEs (512 in 2017) due to the larger number of vessels, but the FTE-per-vessel ratio is lower due to the seasonal nature of small-scale fishery. The LSF employs a total of 386 people, corresponding to 264 FTEs.

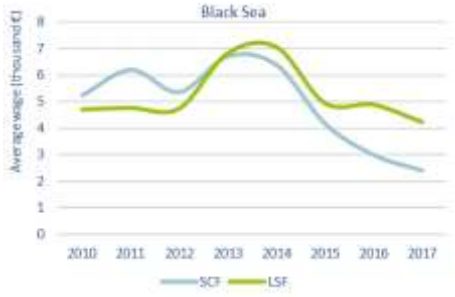
[141] Drift/fixed netters smaller than 6m, 6-12m and 12-18m; vessels fishing with hooks smaller than 6m and 6-12m; vessels fishing with polyvalent passive gear smaller than 6m and 6-12m; vessels fishing with polyvalent gear 6-12m; vessels fishing with pots/traps 6-12m and pelagic trawlers 12-18m.



Trends in employment (in FTEs) for the fleets operating in the Black Sea
Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[142]

Challenges

In contrast to other sea basins, average wages have suffered a decreasing trend over 2008-2017 from an average of EUR 5 250 a month to EUR 3 036 a month, with the exception of a hike between 2013 and 2014 when average salaries were about EUR 6 600 a month. In 2017, average wages were at their lowest points since 2008 for both LSF and SSCF. Compared to 2016, the average wage per FTE in the SSCF fell by 20% (ranging between EUR 3 009 and EUR 2 413) and 13% in the LSF (EUR 4 238), or some 40% lower than the peak in 2014.



Data source: MS data submissions under the 2019 Fleet Economic data call (MARE/A3/AC(2019))[143]

Trends in average wage by fishing activity for fleets operating in the Black Sea

The nationality of crews in the Black Sea fleet is less diverse than at the EU level. While in Romania 4% of the crew are non-nationals, in Bulgaria this percentage is 0.1%. This could be explained by the low average salaries in the region, which are not attractive enough for foreigners.

The education level in the Black Sea region seems to be higher than at EU level. Based on the social data provided, 53% of Romanian fishers have a low education level, while the percentage for Bulgarian fishers is 11%. At regional level and in both countries the percentage of fishers with a high level of education is higher than at EU level.

Black Sea fishery is dominated by small-scale coastal vessels dispersed across 73 landing places (15 in Romania and 58 in Bulgaria). They utilise a large number of fishing techniques

[142] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567 (p. 90).
[143] Footnote 142 (p. 188).

including set gillnets, hand-lines, pole-lines (mechanised or hand-operated), set longlines, drifting longlines, pots and traps, and vessels without gear, all adapting to fishing seasons and fluctuations in species abundance. The 1 302 SSCF vessels are the backbone of the region's fisheries, since they account for 91% of the region's vessels, 84% of the total employment (66% of FTEs) and 68% of the total days at sea. In the majority of cases, vessels are operated by the owner or a family member and carry out very small-scale operations. Many vessels record a low level of activity because the catch is intended for private consumption.

The capacities of the small-scale fisheries sector are limited in terms of human capital (ageing fishers, difficulty in attracting young people, lack of access to proper education, working conditions, safety rules on board), investment and innovation. As a consequence, the sector has difficulties meeting minimum compliance requirements for data collection, traceability and monitoring, control and surveillance measures.

The share of SSCF in the economic outputs is low. They land only 27% of the total weight (4 658 tonnes) and 30% of the value (EUR 2.8 million); from a revenue of EUR 2.9 million, a net profit of only EUR 222 000 is generated by the Black Sea SSCF (in 2017, GVA is estimated at around EUR 1.7 million and gross profit at EUR 442 000). This lower value compared to the LSF seems to reflect the use of different marketing channels, as the SSCF generally operates through very short supply chains. 7 of the Bulgarian SSCF segments generated net losses, but the other 2 Bulgarian SSCF segments together with the 2 Romanian SSCF generated a net profit.

The overall picture describes a dominant role of SSCF that is only able to achieve very limited economic output. Only part of the fishing activity is profitable, and is concentrated on a few emblematic species. IUU fishing activities are widespread, and undermine sustainability and economic prosperity. Economic development in the coastal areas is uneven, with few alternatives for diversification, poor or no infrastructure and minimum interest in investments and innovation.

The relevance of the small-scale fisheries was acknowledged with the adoption, as part of the GFCM, of the Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Seas (September 2018). It is an ambitious plan that aims to ensure the long-term environmental, economic and social sustainability of small-scale fisheries. The action plan sets forth specific actions to be implemented in the challenging areas where there is an urgent need to improve the situation in the Black Sea, namely scientific research, collection of data, management measures, the value chain of small-scale fisheries, promoting the role of women in fisheries and addressing climate and environment challenges.

5. Promoting sustainable and profitable aquaculture

In 2016, there were 3 800 FTEs working in the aquaculture sector in the Black Sea, representing 8.8% of the total in the EU. Aquaculture production in Romania and Bulgaria focuses on trout and carp (see Section on Inland Areas). Bulgaria also produces mussels, which is a developing industry.

Strengths

The cultivation of Mediterranean mussels continues to grow in Bulgaria, as the demand for this species is growing not only in the domestic market but also for export. The main goal in the Bulgarian multiannual national plan is to increase aquaculture production in order to reach 20 000 tonnes by 2020 (43% increase) and to increase freshwater fish farming by 34.5% in volume the by 2020. This goal seems achievable, all the more so since mussel cultivation at

the Bulgarian Black Sea coast benefits from research and innovation (biotechnological and full-cycle technology) on black mussel cultivation.

The objectives of the Sofia Declaration include the sustainable development of aquaculture in the Black Sea. To this end, it intends to promote knowledge, sharing of expertise and improvement of skills. Romania hosts a GFCM Aquaculture Demonstrative Centre.

Challenges

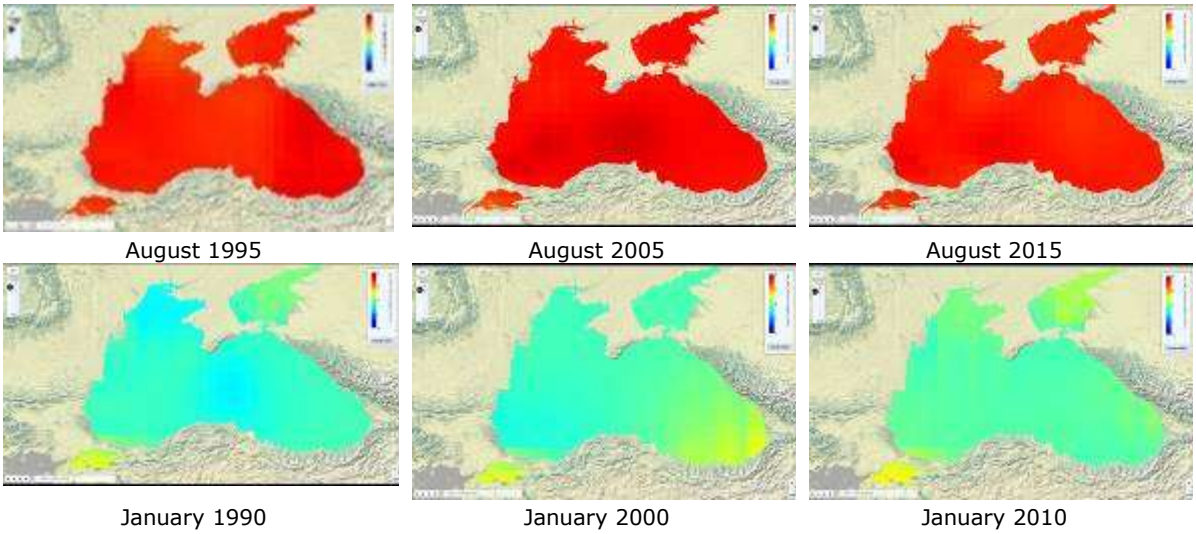
In Bulgaria, although the structure of the market has improved over the past few years, better organisation and construction of retail stores and the wholesale distribution network of fish and fish products is still needed. It is also necessary to encourage and support the establishment of producer organisations, which should be able to improve the management of their activities, increase their sales and raise demand for their products.

Other areas where there is room for progress are diversification of production to new species, adding value to mussel production, particularly through innovations in processing, utilisation of waste and differentiation of production through conversion to organic production.

Maritime spatial planning is necessary to meet the potential needs of the aquaculture sector. Some progress has already been made, with Bulgaria implementing a measure for the development of the sub-sector into its regional development plans in order to ensure enough space for aquaculture.

Harnessing the potential of aquaculture for the environment (e.g. algae or mussels) is particularly important in Bulgaria, due to the level of eutrophication of the Black Sea. Finally, establishing transparent environmental monitoring plans and reporting and collection by competent authorities of data on environmental indicators of aquaculture activities is important to limit the environmental footprint of aquaculture activities and increasing their social acceptance.

6. Enabling climate change adaptation and mitigation



Data source & visualisation: EMODnet physics portal

Average Sea Surface Temperature (SST) for months January and August (1990 to 2015) for the Black Sea (analysis of in situ data)

The effect of the changes in sea temperature, which besides the increase in average sea surface temperature is also visible in extreme phenomena, will inevitably influence all aspects of regional coastal and marine social-ecological systems, including blue economy sectors and adaptation/mitigation strategies. These phenomena can be more intense in the Black Sea, compared to other sea basins, due to its secluded character.

7. Fostering the local development of a sustainable blue economy

The Black Sea blue economy has started to grow in recent years. In the Black Sea basin, the blue economy generated EUR 2 billion in GVA in 2017 and 0.14 million jobs, mainly in the coastal tourism sector, followed by shipbuilding and repair and port activities, therefore representing an important source of growth and employability in the region.

The sustainability of the Black Sea ecosystem requires better environmental monitoring and observation and improvements in research and innovation infrastructure. The fight against plastic waste is also a priority, as the Black Sea ranks second in the EU after the Mediterranean on plastic pollution density. Further cooperation on maritime spatial planning could make a substantial contribution to the sustainability of the Black Sea blue economy.

In this context, in May 2019 the six riparian states of the Black Sea and the Republic of Moldova endorsed both the Common Maritime Agenda for the Black Sea (CMA)[144] through a Ministerial declaration and its scientific pillar Strategic Research and Innovation Agenda[145], which addresses research challenges to boosting the sustainable blue economy in the Black Sea. The CMA is a unique framework for regional cooperation on maritime affairs and the blue economy that also tackles the restoration of endangered marine ecosystems. The three goals of the CMA – a healthy coastal marine ecosystem, an innovative blue economy and fostering investments - are broken down into 10 priorities covering: (i) protection of the marine ecosystem: (ii) marine litter: (iii) fishery and aquaculture: (iv) green transports: (v) digitalisation: (vi) coastal and maritime tourism: (vii) maritime entrepreneurship and clusters: (viii) marine research infrastructures: (ix) innovative business models: and (x) financial investment and blue skills. With its cross-sector approach, the CMA is a strong tool for improving sustainable growth opportunities, tackling common challenges and improving regional dialogue between EU Member States and neighbouring countries, while improving national efforts in terms of prioritisation and related investments. The GFCM regional office is part of the CMA governance, as an official observer.

The Black Sea region can build on the experience of CLLD to foster the sustainable development of the blue economy at local level.

In 2014-2020, there are 33 FLAGs in the Black Sea area, covering on average 1 314 km² – well below the 2 277 km² average over all sea basins – and a population of 71 636 people. The fisheries sector employs on average 322 workers in each FLAG area, 68% in the catching sector and only 14% in the processing sector; aquaculture represents 18% of employment.

Receiving an approximate EMFF contribution of EUR 1 694 100 during 2014-2020, these FLAGs have a typical total budget of EUR 2 196 556, which is higher than the average for all sea basins. It is noteworthy that most of the FLAGs are inland, covering activities that take place in lakes and ponds, rivers and marine waters from the Black Sea. CLLD addresses low income and poverty in the fisheries sector and the increasing emigration from these areas due

[144] https://ec.europa.eu/maritimeaffairs/press/black-sea-ministers-endorse-common-maritime-agenda_en

[145] https://ec.europa.eu/info/news/launch-european-black-sea-strategic-research-and-innovation-agenda-2019-may-08_en

to poor socio-economic conditions and low organisational and administrative capacity. In this context, CLLD aims to encourage new investment in local communities, adding value to the local catches, diversifying outside the fisheries sector and promoting social well-being and cultural heritage. Social issues are targeted, but environmental and governance-related projects seem to have a lower priority than for the rest of the FLAGs.

Challenges in the Black Sea include:

- the need to develop an appropriate governance framework for the fisheries sector, which remains fragmented, with SSCF's interests poorly represented;
- a lack of planning at sea basin level, which can lead to usage conflicts;
- a lack of processing facilities and processes;
- a lack of appropriate infrastructure for the fisheries sector;
- a degraded marine environment experimenting strong biodiversity loss and marine pollution.

The Common Maritime Agenda for the Black Sea tackles these challenges, or some of them, and provides a common environment to discuss regional and national solutions and to identify concrete projects and related funding mechanisms.

Opportunities for FLAGs could include:

- supporting better organisation of the fisheries and aquaculture sectors and their links with processors, distributors and marketing chains, with a special focus on SSCF;
- supporting the adoption of maritime spatial planning principles;
- seeking to add more value to the local catches through cooperation and exchanges;
- developing environmentally-friendly tourism linked to fisheries;
- supporting aquaculture development and diversification, notably for mussels and algae;
- supporting projects aiming at improving the marine environment;
- promoting business based on the use of blue biomass (seafood by-products and algae).

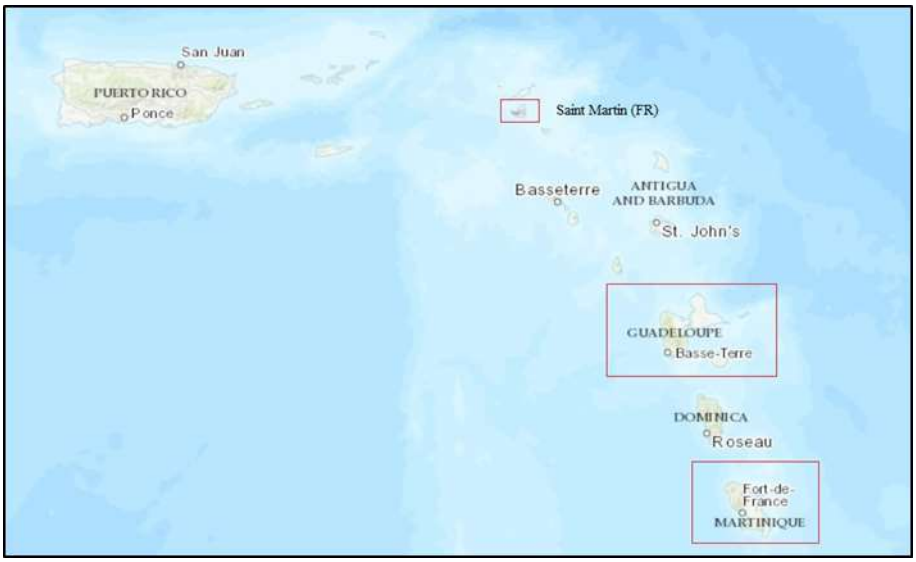
Through multi-funding, these FLAGs could address larger projects such as upgrading the infrastructure required by the fisheries sector or mitigation climate change impact.

OUTERMOST REGIONS

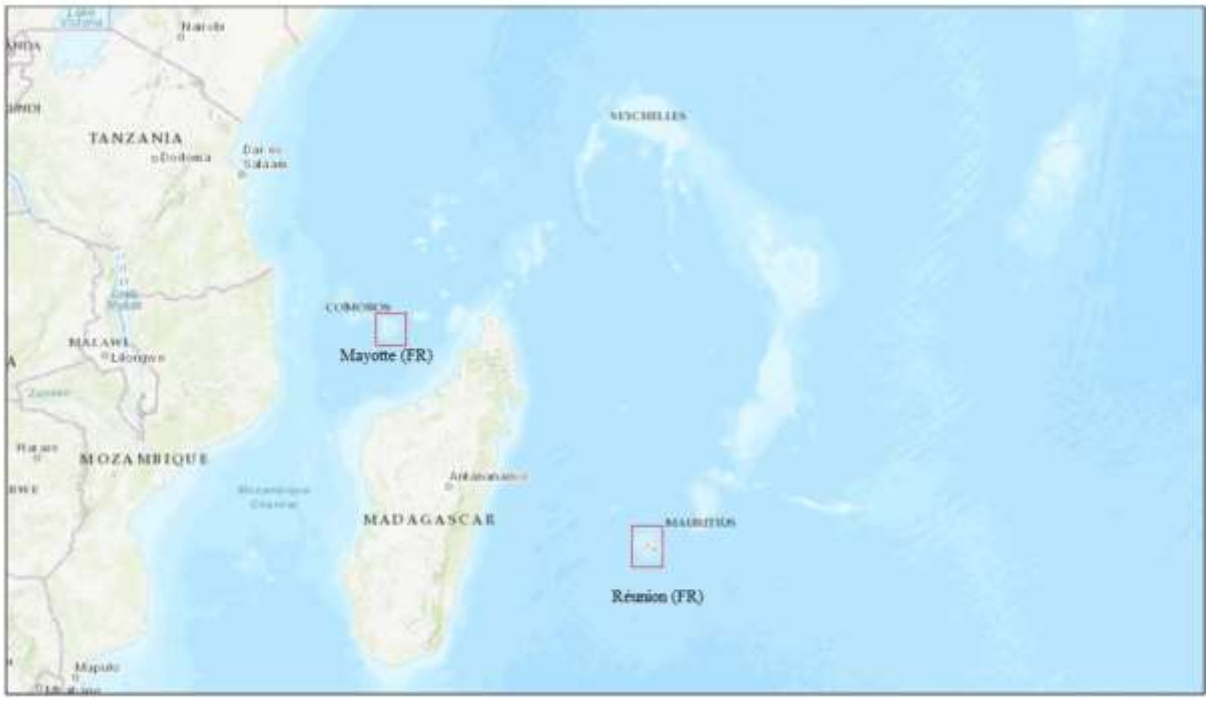
1. Scope

The term 'Outermost Regions' (ORs) refers to the nine remote territories belonging to EU Member States. Six of these territories -– Guadeloupe, French Guiana, Martinique, Mayotte, La Réunion, and Saint-Martin – are French, one – the Canary Islands – is Spanish, and two – the Azores and Madeira – are Portuguese autonomous regions.

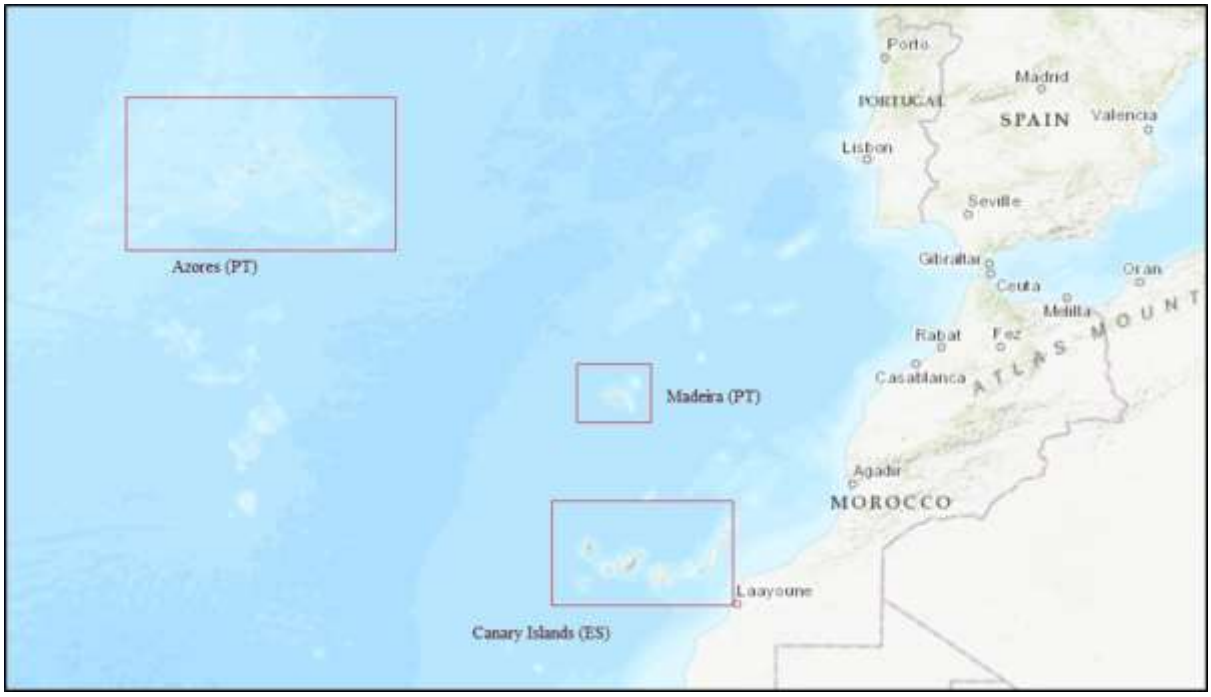
French ORs in the Western Atlantic



French ORs in the Indian Ocean



Spanish and Portuguese ORs in the Atlantic



2. Ensuring sustainable management of natural resources

Given their location in very different geographical environments and ecosystems, fisheries in the ORs are very diverse. In general, tuna and other large pelagic species make up a significant part of the landings, with skipjack, bigeye, yellowfin, and albacore tuna the largest components by weight[146].

[146] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2018 Annual Economic Report on the EU Fishing Fleet (STECF 18-07), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J.

The Azores have a very rich biodiversity, and fishing fleets target both demersal and large pelagic species. The main species landed, by weight, are bigeye tuna (17%), albacore (10%), skipjack tuna and blue jack mackerel (8% each), and European conger and blackspot seabream (7% each). In terms of value, 20% of the landings are from red seabream, followed by bigeye tuna (11%), red porgy (6%), and albacore, blackbelly rosefish and wreckfish (5% each).

In Madeira, the most important species are black scabbard (42% of the total landed weight) followed by bigeye tuna (15%) and blue jack mackerel (13%). Combined, these three top species represent 70% of the total landings by weight. In terms of value, black scabbard and bigeye tuna remain the two most important species (61% and 20% of the total value landed, respectively), followed by albacore (7%) and limpets.

The main fishing activities of the Canary Islands are coastal artisanal fishing (for small pelagic species, demersals and tuna), cephalopod fishing off the coast of Africa by a fleet of freezer trawlers, and high seas tuna fishing. Tunas have constantly formed the large majority of the landings in recent years[147]. Landings (by weight) are dominated by large pelagic species: albacore (25%), skipjack tuna (19%) and bigeye tuna (7%), and also Atlantic pomfret (10%). In terms of value, the most valuable species are also albacore at EUR 7.5 million, Atlantic pomfret at EUR 3 million, and skipjack and bigeye tuna, both at EUR 2.2 million in 2016[148].

In Guiana, the 2016 income from landings was EUR 5.9 million, mainly coming from Penaeus shrimp. In Guadeloupe, the main species fished were common dolphin fish (28% by weight), parrot fishes (9%) and yellowfin tuna (8%). In La Réunion, the most important species are large pelagics (90% by weight) consisting of swordfish (37%), yellowfin tuna (20%), bigeye tuna (14%), albacore (13%) and blue marlin (5%). In Martinique, landings (by weight) are dominated by snappers (40%), which account for approximately 50% of the landed value, followed by yellowfin tuna (16% by weight) and blue marlin (13%). Total landings in Mayotte were slightly more than 1 000 tonnes in 2016. The main species were marine fish species without identification (49%), followed by skipjack tuna (28%) and yellowfin tuna (17%). Information about Saint-Martin fisheries is sparse. According to FAO estimates, 90 tonnes of marine fish were landed in 2016, and all were taken in the Western Central Atlantic (FAO area 31)[149].

Fisheries management in the ORs follows very specific patterns since, for the most part, it is regulated by the CFP and by regional fisheries organisations, with specific measures by Member States[150]. As a common issue, fisheries in the ORs are characterised by a wide variety of species and gears, small-size vessels and numerous landing places. The diversity and variability (seasonal changes) of activity of the small-scale fishing fleets, which is predominant in most ORs, is generally high. Scientific methods and data have not yet been explored

editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-79390-5 (online), doi: 10.2760/56158.

[147] Note on Fisheries in the Canary Islands, by the Directorate-General for internal policies, policy department B: Structural and cohesion policies, European Parliament (2013).

[148] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2018 Annual Economic Report on the EU Fishing Fleet (STECF 18-07), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-79390-5 (online), doi: 10.2760/56158.

[149] Footnote 148.

[150] The Azores has a model of direct management for red seabream, managed directly with fishers, which includes fisheries-shared management by island and vessel, minimum legal size for red seabream fisheries, selective new gears and redirection of fishing activity for species of low commercial value. Some ORs have delegated TACs: Madeira for horse mackerel and black scabbard in Union waters of CECAF; the Azores for horse mackerel in area 10 and Union waters of CECAF; Canary Islands for horse mackerel in Union waters of CECAF; and French Guiana for Penaeus shrimp.

specifically and in depth to support the assessment of small-scale, multispecific and multispecies fisheries in the data-limited context of ORs. Hence, only a fraction of OR fisheries is subject to TACs. The evaluation of the state of play of the main objectives of the CFP (applying the precautionary approach and achieving MSY, implementing the ecosystem-based approach to fisheries management, eliminating discards and ensuring coherence with environmental legislation) is difficult, therefore, all the more so because scientific data and advice are limited.

Strengths

Most of the stocks fished in Madeira, the Azores and the Canary Islands are under the purview of the International Commission for the Conservation of Atlantic Tunas (ICCAT). Several of the main targeted stocks (albacore, bluefin tuna, yellowfin tuna, bigeye tuna, swordfish and sailfish) are under TACs regimes. The skipjack stock is healthy, as is the Atlantic bluefin tuna. Other important stocks such as black scabbard in Madeira and the blackspot seabream in the Azores seem to be in a stable condition[151]. In the Western Atlantic Territories, skipjack stock is healthy, as is Atlantic bluefin tuna[152].

At EU level, a multiannual plan for the Western Waters was adopted in February 2019. It applies to fisheries active in the Azores, the Canary Islands and Madeira, and aims to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce MSY. The plan also contains safeguard measures to restore stocks when they fall below safe biological limits, and sets a framework for improved cooperation between the Member States concerned.

In the Indian Ocean, the fleets of La Réunion and Mayotte are active in areas under the purview of the Indian Ocean Tuna Commission (IOTC). There are harvest control rules for skipjack tuna, and for many stocks the IOTC has recommended precautionary measures, strengthened mechanisms due to excessive catches or a reduction in catches. Due to the paucity of data or a high degree of uncertainty of data, the Commission has suggested that more efforts are needed to gather accurate data for stocks such as black marlin and several shark stocks[153]. Several stocks in the region are deemed not to be overfished. These include commercially important species such as albacore, bigeye and skipjack, and some less important species such as black marlin[154].

In the Caribbean, the fisheries of Martinique and Guadeloupe fall under the umbrella of ICCAT and WECAFC. There is good coordination between the two French scientific institutes in charge of data collection. As a pilot study under the Data collection framework, France is testing a statistical approach to estimate economic yearly indicators in some areas.

Challenges

ORs are characterised by being islands of volcanic origin with a very narrow continental shelf (the only exception is French Guiana). This implies that the most accessible fishing grounds occur only in a narrow fringe around the isles. The demand for fish products is high, particularly from the tourism sector. As a consequence, fishing pressure has been concentrated historically on the coastal fishing grounds, resulting in their chronic overexploitation, which contributes to

[151] www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/bsf.27.nea.pdf; www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/sbr.27.10.pdf
[152] https://iccat.int/Documents/Meetings/Docs/2018/REPORTS/2018_SC_ECO_REP_ENG.pdf
[153] www.iotc.org/sites/default/files/Summary_of_Stock_Status.pdf
[154] www.iotc.org/sites/default/files/Summary_of_Stock_Status.pdf

global biodiversity loss. There is, however, limited scientific assessment of the situation (see below).

For pelagic and demersal stocks where scientific assessment is available, there are many situations of overexploitation of commercially important species. In the Spanish and Portuguese ORs, yellowfin tuna and white marlin stocks are overfished. Atlantic bigeye and blue marlin are overfished. Mako in the North Atlantic is possibly overfished. Swordfish stock in the South Atlantic is also overfished. Albacore stock is being closely monitored as it is in a precarious condition. In addition, in Madeira, the state of horse mackerel required additional management measures in 2019 by way of reduction of fishing effort of the fleet through limitation of days of annual activity of vessels, increase of distance from the coast to minimise captures of fish below minimum reference size (15 cm) and establishment of a temporary closure of the fishery during spawning season.

In the Indian Ocean, yellowfin tuna and striped marlin stock have relatively poor status, with recent data indicating that the stocks are overfished. Blue marlin and indo-pacific sailfish are subject to overfishing. Swordfish, longtail tuna, narrow-barred Spanish mackerel, bullet tuba, frigate tuna and kawakawa are being closely monitored due to potential risks to future stock status if current trends continue[155].

In the Caribbean ORs, target species can be divided into small pelagics, large pelagics and demersal stocks. Small pelagic stocks represent around 20% of the landings and are not subject to stock assessment, as they are species of very short lifespan and landings vary from one year to another. The large pelagic stocks are under ICCAT regulations. Therefore, the main unknown is the demersal fishery, which accounts for about 60% of the landings and where resources are exploited by other countries as well. In addition, this fishery can catch juveniles of many other species when performed close to the coast. Distances between landing ports add to the difficulties of obtaining frequent and correct sampling. As regards Guiana, the Commission advised France in April 2019 to review the TAC set for shrimps in 2019 and called for a management plan to be put in place based on STECF analysis. France committed to exploring solutions within the Western Central Atlantic Fishery Commission (COPACO/WECAFC) and is supporting a new research study by IFREMER.[156]

With regards to the ecosystem-based approach to fisheries management, available evidence indicates considerable risk to sharks, cetaceans, seabirds and marine turtles in the Indian Ocean, particularly from gillnets and longline fishing[157]. More generally, fisheries in the tropical ORs exploit biodiversity hotspots, so there is a growing concern and interest in taking environmental aspects into account. According to the European Environmental Agency, Macaronesia has a low coverage of MPAs, including designated Natura 2000 areas[158]. There is also a severe lack of information on the composition, abundance and density of marine litter, both on coasts and the seabed, in the ORs. Member States are advised to increase collecting and removing efforts and register them through official sources such as the EMODnet chemistry portal.

[155] www.iotc.org/sites/default/files/Summary_of_Stock_Status.pdf

[156] Institut français de recherche pour l'exploitation de la mer (IFREMER) (in English: French Research Institute for Exploration of the Sea): wwz.ifremer.fr/en

[157] http://iotc.org/sites/default/files/documents/2019/02/IOTC-2018-WPEB14-RE_FINAL.pdf

[158] www.eea.europa.eu/publications/marine-protected-areas

3. Improving enforcement and control of fisheries and the provision of data

3.1 Collection of scientific data

Strengths

In most ORs, efforts have been made to set up fisheries statistics information systems to ensure that data on fishing effort and landings are available. All three Member States include the ORs in their national work plans, and implementation of the data collection framework is making some progress. In the Canary Islands, Madeira and the Azores, the difficulties associated with sampling catches are partially resolved by means of scientific observers on board commercial vessels.

The ORFISH[159] project funded in 2018 aimed to find solutions to reduce fishing pressure away from the coastal zone in the ORs. It concentrated on technology transfer of fishing techniques, addressing the problems encountered and testing alternative low-impact gears and alternative fishing grounds. Recognising the differences between the ORs, this work was conducted in all regions.

This project also produced an inventory of fisheries data from 2008 to 2016, based on all the available data from the EU Fleet Register, the Data collection framework and regional data. Data on 34 variables were gathered and analysed for each OR for the following four categories: 1) fleet structure; 2) active fleet characteristics; 3) fleet activity; 4) landings and value of these landings per length class. For each OR, the project gathered the following parameters and indicators: structure of the active fleet (vessels number, length, capacity in tonnage, power and age); gears, métiers; target species; fishing activity and seasonality; fishing areas of operation (coastal, edge of the islands shelves, offshore); means of production (crew size, capital invested, vessel ownership if available); landings per species.

Challenges

Stock assessment in the ORs began relatively recently, with the exception of the deep-sea fisheries in the North-East Atlantic ORs and species monitored within Regional Management Fisheries Organisations (IOTC and ICCAT for tuna species and the Southern Indian Ocean Fisheries Agreement (SIOFA))[160]. Fisheries management and the sustainability of the fisheries could be improved by better monitoring of local fish stocks, which cover both tuna and non-tuna species and straddling stocks, as the status of many of these stocks is still unknown. Notably, in the Western Atlantic ORs, data on several species of pelagic sharks and small tunas are insufficient to properly assess the stocks[161]. Reliable data on stocks important to the French Guianese fleet, like the penaeus shrimp, is scarce.

In this context, sampling methods need to be further improved to live up to the ambition of the 2017 EU Data Collection Regulation[162], in particular for discards and unwanted catches and

[159] ORFISH project's results - Development of innovative, low-impact offshore fishing practices for small-scale vessels in outermost regions – DG MARE/2015/06. The main material of the pilot project is available at https://orfish.eu. It also includes a database of the fishing fleet in the ORs and their evolution.

[160] European Commission (2017, September). Realising the potential of the Outermost Regions for sustainable blue growth. Final Report https://ec.europa.eu/regional_policy/sources/policy/themes/outermost-regions/pdf/rup_2017/rup_sust_blue_growth_en.pdf

[161] https://iccat.int/en/assess.html

[162] Council Regulation (EC) No 1224/2009, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005, (EC) No 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No

the incidental by-catch of listed prohibited and sensitive species by commercial fisheries, and for data collection based on pilot studies planned in the current EU MAP for recreational and small-scale fisheries (including biological, effort and landings data).

With regards the small-scale fisheries, the ORs face particular challenges. Most fisheries are small scale and artisanal, characterised by many different gear types, target species and landing points, and the assessment methods developed on the mainland are not always fully valid in the ORs. Member States are developing different methods through pilot studies under the EU MAP. In general, the high specific diversity of the demersal resources (sometimes more than 150 exploited species with no clear dominance of species) poses a challenge to data collection, science and stock assessment. Moreover, fisheries in the tropical ORs exploit biodiversity hotspots, so there is a growing concern and interest in taking environmental aspects into account and adjusting data collection to this specific situation. Given the specifics and diversity among the ORs, methodologies to collect data or knowledge on fisheries and the related marine ecosystem should therefore be adapted or developed for each specific OR. Positive experiences from pilot studies developed by individual Member States need to be integrated into the mainstream of data collection activities over time.

Regional coordination could play a role in this regard. However, the RCGs for large pelagics and for long-distance fleets do not cover all fisheries in all the ORs, and coordination on data collection and science among the relevant Member States is mainly done through other RCGs and fora such as the Planning Group on Economic Issues (PGECON) for social and economic data. To assist and coordinate work, a specific STECF expert group worked in January 2020 on data collection and science in the ORs. It has identified gaps and set up a roadmap to prioritise specific issues and processes necessary to address the following four challenges: data collection, stock assessment, ecosystem knowledge, and social and economic impacts.

Beyond technical and biological data, there are significant deficiencies in the collection of economic data (data on effort trends over the past decade in the French ORs are not available, income and cost data from Martinique and Mayotte are not available). In view of this, Member States should make an effort to collect and recover economic data on their OR fishing fleets, including, where possible, historical time series[163]. The 2019 data submissions for the Annual Economic Report from France and Spain improved, but continue to be incomplete.

In order to improve the economic analysis of the OR fleet, a geographical indicator was introduced some years ago on a recommendation by STECF to enable a distinction to be made between (1) fishing fleets operating in ORs (local fleet), (2) fleets operating predominately in non-EU waters and (3) fleets operating exclusively in international waters. Portugal has made extensive use of this additional segmentation while Spain and France have not yet made much use of it. Together with other data limitations, this further prevents the analysis of EU fleet activity on the desired scale, and compromises fisheries and fleet management in these regions.

3.2 Enforcement and control

Strengths

509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006.

[163] Scientific, Technical and Economic Committee for Fisheries (STECF): The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06), Dentes De Carvalho Gaspar, N., Keatinge, M. and Guillen Garcia, J. editor(s), EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-09517-0 (online), doi:10.2760/911768, JRC117567.

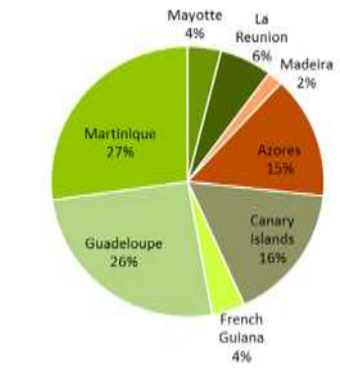
Some remedial measures, for example training, awareness raising and updated fleet registration have been launched recently to strengthen fisheries control in the ORs.

Challenges

The ORs currently lack a well-functioning basic control structure. Data on catches in some ORs are estimates and do not take informal activities into account. The Caribbean ORs, in particular, are characterised by small-scale fleets with one-day trips, direct sales to consumers and hardly any bookkeeping. There is a need to increase control resources (e.g. more fisheries inspectors, better equipment, etc.) and put in place reliable electronic catch reporting. The control of non-EU vessels is also a challenge.

4. Ensuring a balanced socio-economic outlook for the fisheries sector

Combined, the EU OR fleet numbered 3 034 active vessels in 2017 (4 437 including inactive vessels). With 1 737 vessels, the French OR fleet was the most numerous, accounting for 57.5% of all reported vessels. The Portuguese fleet comprised 673 vessels (22%) and the Spanish fleet 624 vessels (20.5%). Martinique, with 662 active vessels, was the largest OR fleet (by number), followed by Guadeloupe (611), the Canary Islands (583), the Azores (557), La Réunion (203), Mayotte (122), French Guiana (128), Madeira (82), Canaries vessels operating in Mauritania (19) and St Martin (11).



Share of capacity (number of vessels) by outermost region in 2016[164]

About 91% of the vessels in ORs belong to the small-scale coastal fleet, the highest percentage across the different sea basins. The percentage varies between 84% in the Azores and 100% in both Martinique and Guadeloupe. However, small-scale fishing vessels constitute less than 60% of total OR fishing capacity expressed in kW, due to the presence of large-scale fishing vessels, except in Guadeloupe and Martinique where no such vessels are registered.

In 2005-2016 the number of fishing vessels decreased in all ORs. Based on available information, the highest decrease in the number of vessels is found for Portugal (-40%) and for Spain (-31%), and somewhat more limited for France (-15%). However, the aggregate engine power of the fishing fleets increased in the ORs of France (+26%) and Portugal (+15%) as a consequence of increases in the average engine power of the vessels registered. In the Canary Islands, aggregate fishing power decreased by 31%.

The administrative situation of OR fleets in early 2016 indicates that all fleet segments in Portuguese ORs as well as the Guadeloupe small-scale segment are nearing their respective

[164] Footnote 163 (p. 204).

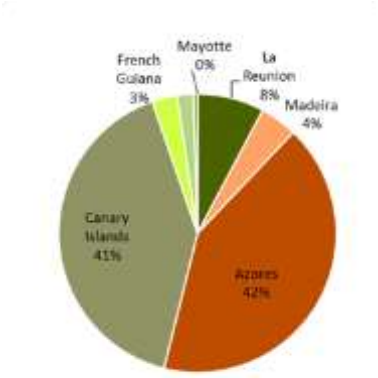
capacity limits set by the CFP Basic Regulation. Conversely, Martinique small-scale vessels and French Guiana small-scale vessels and shrimp trawlers, as well as Canary Islands large-scale trawlers, are at less than 70% of their respective ceilings. Other segments in the Canary Islands are between these two figures.

4.1 Providing conditions for an economically viable and competitive fishing sector

Contrary to other sea basins, it is technically impossible to present aggregated data and time series for the effort and socio-economic data, due to the many data gaps explained above. For the French and Spanish ORs, only partial data are available for 2017, and the 2010-2016 data are very incomplete. Full time series are only available for the Portuguese ORs. Despite these gaps, some aggregate data are presented for 2017 with the limitation of a complete lack of economic information for 28 French fleet segments.

Strengths

The OR fleet spent 165 028 days at sea in 2017. Since 2010, effort trends have varied in the Spanish and Portuguese islands. Days at sea for the Azores fleet have dropped dramatically from over 80 000 in 2010 to around 50 000 in 2017, while the Madeira and Canary Islands fleets have been increasingly active since 2013.



Share effort (days at sea) by outermost region in 2016[165]

The OR fleet landed approximately 20 000 tonnes of seafood in 2017 with a value of EUR 89 million (data for Martinique and Mayotte are not included in these totals). This represents an average price of 4.45 EUR/kg, which is the highest across the different sea basins. The Canary Islands fleet was the most important (by landed weight and value), generating an income of some EUR 34 million (66% of the total by weight and 56% by value), followed by the French (EUR 19.6 million) and Portuguese (EUR 18.5 million) OR fleets.

OR fleets mostly supply local markets with fresh fish. However, in terms of revenue, there is a high specialisation in tunas and other large pelagics which are often processed (canned or frozen) and exported to the EU mainland. These species represent a significant part of the landings with skipjack, bigeye, yellowfin, and albacore tuna being the largest components by weight. It is noteworthy that the price obtained for these species is very dependent on the international market price, while landings depend on the status of stocks. However, the prices of these commercially important stocks for the ORs show an overall pattern of steady increase.

The OR fleets do not seem to be very dependent on fuel prices and recorded relatively low fuel consumption. In Madeira, fuel consumption has decreased while effort (days at sea) has

[165] Footnote 163 (p. 204).

increased, suggesting that some change in the activity pattern has occurred together with lower average fuel prices.

Overall, the economic performance of most OR fleets is improving. GVA was estimated at EUR 99 million in 2017 (excluding 28 French fleet segments due to lack of economic data), representing an overall increase of 40% compared to 2014. Overall, the OR fleet generated a gross profit of EUR 24 million, while net profit was estimated at just over EUR 12 million. It is to be noted that the Azores fleet saw a 6% increase in revenue in 2017 compared to 2016, reaching one of the best values in all the time series.

Given the lack of data submitted by Spain and France, it is not possible to provide a comprehensive outlook for the OR fleets. However, the current trends in fish prices and fuel costs suggest that these fleets may continue to be generally profitable in the coming years.

Outermost regions - Key economic indicators in 2017**		
Capacity		
Total number of vessels	(#)	2.015
Vessel tonnage	(GT)	17.226
Engine power	(kW)	186.663
Landings		
Live weight of landings	(tonne)	37.683.917
Value of landings	(thousand €)	127.093.576
Effort		
Days at sea	(day)	165.028
Energy		
Fuel consumption*	(thousand litres)	28.139.129
Energy costs	(thousand €)	14.161.144
Employment		
Total employed	(person)	6.411
FTEs	(#)	3.179
Wages and salaries	(thousant €)	75.436.139
Labour productivity*	(GVA/FTE)	23.731,4
Performance		
Gross Value Added	(thousand €)	99.350.458
Gros profit	(thousand €)	23.914.319
Net profit	(thousand €)	12.298.042
* Estimated		
** Does not cover 28 FR fleet segments (1.019 vessels) for lack of economic data		

Challenges

The Portuguese ORs faced different situations. In Madeira, profitability of the fleet has been positive for the whole of 2010-2016. In 2016, landings were up 49% by weight and 41% by value, and income increased by 79% to EUR 47.5 million. In 2016, the GVA margin was 71%, the gross profit margin 26% and the net profit margin 21%. By contrast, activity in the Azores contracted: days at sea fell by 44.5% (from over 73 000 in 2010 to just over 40 000 in 2016) and energy consumed by 65%; landings were down 52% during the period in volume and 16% in value; revenue decreased by 11% and GVA decreased by 20%.

Trends for the Portuguese OR fleets (Azores and Madeira)

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of vessels	1.254	1.306	1.327	1.277	1.237	1.204	1.200	1.197	1.198
Total vessel tonnage	12.419	13.088	13.256	13.083	12.327	12.315	12.222	12.398	12.599
Total vessel power	64.680	69.393	70.990	69.179	67.693	67.140	67.079	67.773	68.470
Landed weight per fishing day	6.834	6.631	8.848	8.301	9.114	8.294	9.101	8.502	7.661
Days at sea	80.440	72.525	63.880	64.859	57.786	57.870	52.783	57.713	49.947
Engaged crew	3.302	3.654	3.122	4.126	3.373	4.091	3.131	3.039	3.010
FTE national	1.947	2.003	1.798	2.271	1.916	2.298	1.697	1.749	1.571
GVA per FTE (labour productivity)	274.581	307.157	273.609	218.407	214.503	186.359	231.615	199.007	247.533
Gross Value Added	36.545.857	34.314.695	40.360.747	37.346.738	36.780.102	31.294.447	32.739.601	32.354.130	30.261.100
Gross profit	15.612.157	15.026.673	18.839.053	15.858.690	15.223.951	12.740.692	13.221.804	12.465.782	12.389.114
Net profit	8.388.430	5.081.522	9.450.629	5.627.706	4.127.971	2.826.651	4.698.611	5.783.165	5.897.488

According to available information, only one OR fleet recorded overall gross and net losses in 2017, that of La Réunion. It registered EUR 0.4 million in GVA, down from EUR 1.9 million in 2016, but suffered a gross loss of - EUR 1.5 million (increasing from EUR 160 000 in 2016) and a net loss of - EUR 2.1 million (increasing from EUR 993 000 in 2016).

OR fleets face several structural challenges.

The fleets in the ORs operate with some of the oldest vessels active in the EU. Small-scale vessels are newer than their mainland counterparts in the ORs of France (18 years old v 29 years old) and in the Azores (25 years old v 34 years old). However, in the Canary Islands and Madeira, small-scale vessels are older than their mainland counterparts, exceeding 40 years old on average. The Canary Islands in particular has a fleet with an average vessel age of 35 years[166]. The main problem for this fleet is its inactivity and limited activity (18.4% of the Canary Island fleet is inactive).

The development of some fleet segments in the ORs over the past few years has been hampered by the status of the resources targeted (Portuguese fleet segments, French Guiana shrimp trawlers, fishing pressure and/or chemicals on coastal fishing grounds), or in relation to loss of access to historical fishing grounds in the case of the Canary Islands large-scale trawlers. ORs have implemented strategies to lower the fishing pressure on inshore stocks by developing exploitation of available offshore resources. This is particularly the case in the French ORs, with the development of exploitation of highly migratory species around networks of anchored fish aggregating devices (FADs) as far as 40 miles offshore. For Portuguese ORs, developments included exploitation of deep-sea stocks around the seamounts present in the fishing zones.

Better organisation of the supply chain could allow stakeholders to raise the economic performance of the sector. In addition, an in-depth market analysis could highlight opportunities for the small-scale fisheries sector to promote fish locally, for example through making use of certification of origin or direct marketing tools among others. In the French and Portuguese ORs, investments on board (ice and gears) and on landing sites (storage, processing and counters for direct sales) could increase the quality of products and have an impact on sales value. In general, there is a lack of facilities to process fish (other than tuna) in the ORs, as well as outdated auction markets and landing places.

[166] Characterised mainly by small size of vessels (561 vessels are below 12 metres in length), which carry out polyvalent fishing activity (polyvalent gears, for more than one species as target) and for which 62.5% of the active vessels carried out their fishing activity less than 90 days/year.

4.2 Addressing overcapacity

Reflecting the lack of biological and economic data, the annual reports on balance between fleet capacity and fishing opportunities presented by the three Member States concerned cannot provide a full overview of fleet capacity in the ORs. The assessment can therefore only rely on some of the recommended indicators and cannot be presented in an aggregated manner, but by Member State.

In the French ORs, there are 34 fleet segments for which at least one indicator shows an imbalance according to the STECF. However, the biological indicators (stocks at risk, (SAR) and the sustainable harvest indicator (SHI)) are not available, with the exception of La Réunion segments of vessels below 10 m fishing with hooks (with SHI not in balance) and the same type of vessels 10-12 m and 12-18 m in length (where SHI is in balance). The absence of these biological indicators reflects the necessity of improving data collection and stock assessment in these regions. The provision of economic data has nevertheless improved. Data for vessels less than 12 metres in Guadeloupe and French Guiana have been available since 2016. However, the data on efforts and landings were not complete for all OR fleets. This concerned around 990 active fishing vessels based in La Réunion and in Martinique.

France did not submit an action plan for unbalanced fleet segments in its ORs.

In the Portuguese ORs, the STECF identified 8 fleet segments in the Azores and 6 segments in Madeira for which at least one indicator shows imbalance. The SHI is available for all but one segment (drift/fixed netters of less than 10m in the Azores), and it shows an imbalance for 5 segments in the Azores[167] and 5 in Madeira[168]. By contrast, the SAR indicator could not be calculated except for the smallest vessels using hooks in the Azores.

Portugal did not submit an action plan with its 2018 annual fleet report, arguing in particular that tuna fishing vessels over 24 metres in length and vessels landing small pelagic species with encircling gear are now recovering satisfactorily, particularly the 24-metre segment, which has been stable in the past 3 years. According to the national report, seiners have recorded numbers that are very close to the acceptable limit.

In the Canary Islands, the STECF identified 11 out of 15 segments that have at least one biological or economic indicator out of balance. The SAR indicator is not available for any of these segments. The SHI indicator is available for 9 fleet segments, 5 of which are not in balance[169]. For the smaller vessels using active and passive gears, none of the 6 indicators could be calculated. This highlights the ongoing challenge to improve data collection and stock assessment for the Canarian fleet.

Spain did not include specific measures for the Canary Islands segments in its action plan submitted with the 2018 annual fleet report.

4.3 Contributing to a fair standard of living for those who depend on fishing activities

Strengths

Employment and wages roughly reflect the economic performance of the various fleets. In the Canary Islands, the number of FTEs has remained relatively stable over 2010-2016 but

[167] Vessels using hooks shorter than 10 m, 10-12 m and 12-18 m, respectively, and small purse seiners shorter than 10m and 10-12m.
[168] Vessels using hooks shorter than 10 m, 10-12 m, 12-18 m, 18-24 m and 24-40 m, respectively as well as vessels using polyvalent gear shorter than 10 m.
[169] Vessels using pots/traps 10-12 m in length, vessels using hooks of a vessel length below 10 m and 18-24 m and 24-40 m in length, as well as vessels using active and passive gears 24-40 m in length.

increased by 15% in 2016. A large majority of those employed are part-time or occasional workers.

In Madeira, employment fell gradually, with an overall decrease of approximately 25%. The total number of jobs reached its lowest value in 2015, recovering somewhat in 2016, as well as in terms of FTEs, meaning more fishers working more time.

In the Canary Islands and Madeira, wages and salaries have increased steadily in 2010-2016: +56% in the Canary Islands; in +67% in Madeira.

Challenges

The lack of availability of socio-economic raw data (i.e. gross value added, employment and turnover), especially for small-scale coastal fisheries and in France, makes it difficult to produce studies and analyses on maritime and fisheries activities. For the Micronesian ORs, the blue economy has been mapped and information is available, but for many others information is very limited or not updated.

The Azores saw fluctuating levels of FTEs during the same period, with an overall decrease of over 10%. Total employment peaked in 2013 with 3 119 people employed full and part-time, equivalent to 1 601 FTEs, but total employment has fallen by 38% since then and the number of FTEs fell by 47% in the same period. In parallel, crew wages have decreased since 2010, roughly by the same percentage as the decrease in income from landings. Like many other fleets, the Azorean fleet finds it difficult to attract sufficient crew and to ensure generational renewal.

Data on employment in the French ORs measured in FTEs is available only for 2016. In 2016, the fleets of French Guiana, Guadeloupe and Martinique employed an estimated 4 091 people, equivalent to approximately 1 230 FTEs. In La Réunion and Mayotte, it employed an estimated 662 people, equivalent to approximately 171 FTEs. The lower FTE figures in comparison with total employed indicates that a large majority of those employed in these fleets are part-time or occasional workers. Most vessels in Mayotte are less than 6 metres, targeting reef and demersal species. In La Réunion, the main targeted species are large pelagics, but there is an average of 1.5 employees per vessel, suggesting a predominantly small-scale fleet. No employment data are available for Saint-Martin.

5. Promoting a sustainable and profitable aquaculture

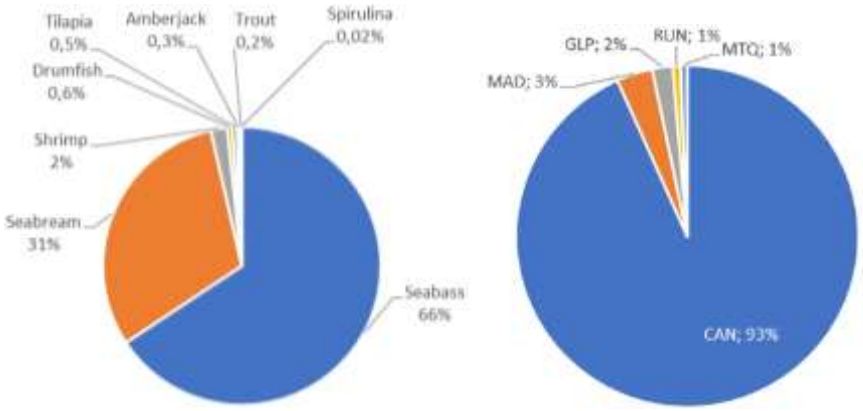
96% of aquaculture production in ORs is in the Canary Islands and Madeira. In terms of species, 97% is seabream and seabass (all in floating cages in the Canary Islands and offshore in Madeira). Species farmed in other ORs are shrimps (in particular freshwater shrimps in Guadeloupe and Martinique), drumfish (Guadeloupe and Martinique), tilapia (La Réunion and Martinique), amberjack (Madeira), trout (La Réunion) and spirulina (La Réunion).

The Canary Islands is the leading territory in terms of volume farmed, accounting for 93% of the total in 2017. This was composed of 5 505 tonnes of seabass, 2 311 tonnes of seabream and 2 tonnes of white shrimp. The volume of production ranged from 6 296 tonnes to 9 046 tonnes since 2014. In 2015, the value of production was EUR 34 million in the Canary Islands and EUR 2.8 million in Madeira[170]. Aquaculture production in Madeira is based on marine farming. Two farms have been active, and produced 285 tonnes of aquaculture products in 2017.

[170] European Commission (2017, September). Realising the potential of the Outermost Regions for sustainable blue growth. Final Report https://ec.europa.eu/regional_policy/sources/policy/themes/outermost-regions/pdf/rup_2017/rup_sust_blue_growth_en.pdf

In the Caribbean-Amazonia (Guadeloupe, Martinique, Saint-Martin, French Guiana), a developing aquaculture industry is found mainly in Martinique (15 aquaculture sites in operation in Martinique in 2015), and to a lesser extent in Guadeloupe (5 sites). For other territories, aquaculture remains at an experimental stage.

In the Southern Indian Ocean, the value produced in La Réunion was EUR 0.5 million in 2012[171]. For marine aquaculture, red drum fish is currently produced in Mauritius, but no longer in La Réunion and Mayotte, although in Mayotte the local authorities are trying to investigate the possibility of relaunching production.



Volume farmed (2017 for CAN and MAD, previous years in other ORs)
Source: EUMOFA

Strengths

The accelerated licensing procedure for aquaculture operations in the Azores offers good investment conditions.

In the Canary Islands there are several species with potential for future use in aquaculture[172]. The waters of the archipelagos offer good conditions for the development of this activity, as they have the right temperatures throughout the year.

Challenges

The main challenges for aquaculture in ORs are related to their remoteness, insularity and topography: constraints on availability of feed and juveniles; limited economies of scale; and high transport costs to potential markets, while their outlet market is predominantly their own country (for example, 45% of production in the Canary Islands is marketed in mainland Spain). An additional difficulty is in treating fish diseases, due to the cost of importing veterinary drugs.

Encouraging the development of local production of feed and juveniles, developing offshore aquaculture and creating local brands and labelling for niche markets could therefore be encouraged, together with conversion to organic aquaculture and diversification of species farmed. Research and innovation as well as skills training are important to achieve these objectives.

Other challenges are high risk of damage to offshore cages due to cyclonic events, limited physical space for aquaculture projects, lack of educated staff with entrepreneurial capacity,

[171] Source: EMFF compensation plan of additional costs for La Réunion.
[172] European Commission (2017, September). Realising the potential of the Outermost Regions for sustainable blue growth. Final Report https://ec.europa.eu/regional_policy/sources/policy/themes/outermost-regions/pdf/rup_2017/rup_sust_blue_growth_en.pdf

difficulty in accessing credit and absence of interest by investors. Specific difficulties are faced in Guadeloupe and Martinique due to chlordecone pollution of freshwater and marine water in the coastal area. The identification of areas suitable for aquaculture should continue to be supported. It is essential to optimise regulations for facilitating investments and obtaining licences.

Finally, establishing transparent environmental monitoring plans and reporting and collection by competent authorities of data on environmental indicators of aquaculture activities is important to limit the environmental footprint of aquaculture activities and increasing their social acceptance.

6. Enabling climate change adaptation and mitigation

In terms of climate adaptation and of the impact of climate change on fisheries, and by extension on all the maritime sectors, ORs are at the forefront. Biodiversity is one of the greatest assets of ORs, to be valued and better protected by Member States.

The key role of ORs is to strengthen the European presence in the Atlantic and Indian Oceans as poles of excellence, as key labs for coastal protection and sea waste, and as platforms to study ocean currents. Recent examples of climate change effects are linked to the sargasso algae bloom in the Caribbean, efforts to tackle coral bleaching and, more generally, the issue of rising sea levels. It seems there is agreement among ORs that the protection of coral and mangrove areas will also be crucial in the mitigation of climate change impacts.

ORs need to focus on coastal erosion, agricultural practices and deforestation as closely interlinked. More research and data are needed in these areas. Cyanobacteria growth driven by climate change and nutrient input is an issue, as there is a need to better control nutrients from inland sources (such as aquaculture). For fishing fleets, decarbonisation could improve the productivity of the fishing sector.

7. Fostering the local development of a sustainable blue economy

The European Commission adopted a new strategy for the ORs in 2017[173], including targeted measures for their maritime and fisheries sectors. It called on all ORs to develop their own blue economy strategy to improve synergies between public policies and investments, and to facilitate access to finance for small-scale operators through micro-credits and financial instruments (such as loans and guarantee funds). To support this process, the Commission carried out a number of studies[174] and provided methodological guidance. These strategies should be used to guide the utilisation of EU and national funds.

The proposed new European Maritime and Fisheries Fund for 2021-2027 provides a renewed and strengthened financial support for fisheries, aquaculture and maritime economy. This new EMFF will be simpler to use, and it will also pay more attention to the specific needs of the ORs than ever before.

The Commission proposed a dedicated budget for the ORs within the overall allocation of the Member States concerned (France, Spain and Portugal). The allocation is defined as a

[173] COM (2017) 623 (final).
[174] https://webgate.ec.europa.eu/maritimeforum/en/node/4111

minimum and Member States can further increase it to cover all their needs. This proposed ring-fenced budget is a step forward in comparison to the 2014-2020 EMFF, which included only a ring-fenced budget for compensation plans for additional costs incurred by ORs. The Commission favours continued compensation to help operators from these regions remain economically viable. A novelty in the proposal compared to the 2014-2020 EMFF is that the allocations for compensation will not be ring-fenced, but capped at 50% of the allocated budget for each OR.

The proposal also anticipates the preparation of an action plan for a sustainable maritime development strategy for each OR, as part of the programme of Member States with ORs. Through this instrument, ORs will be able to develop a comprehensive and coherent strategy for the sustainable exploitation of fisheries and the sustainable development of the seafood sector, as well as the sustainable development of traditional and emerging blue economy sectors. This strategy should outline the management measures of coastal fisheries planned by Member States for the new period and the financial means to support them. This is a clear improvement of the strategic focus on the needs of the ORs compared to the 2014-2020 EMFF.

A high aid intensity rate of 85% is also proposed in the ORs in recognition of their specific characteristics, rising to 100% for small-scale coastal fisheries. This is a substantial advantage compared to the standard aid intensity rate of 50% (with some exceptions) in the mainland.

To support the specific strategic direction for the development of the maritime, fisheries and aquaculture sectors, the 2021-2027 funding should be used in a targeted way to explore the existing potential of ORs, as maritime-based economic activities contribute significantly to their overall economy.

In the Caribbean, coastal tourism, cruise tourism, shipping (maritime transport and ports) and fishing and aquaculture play a major role. Two activities currently at a pre-development stage present considerable growth potential for the near future and could create important job opportunities and value added for the sea basin economy: renewable energy and blue biotechnology[175].

In the Indian Ocean, coastal tourism, shipping (maritime transport and ports) and fishing and aquaculture play an important role in the overall local economy. While these three activities showed significant potential in terms of job opportunities and value added, three other activities have been also identified at a pre-development stage that show growth potential in the near future: cruise tourism, renewable energy and blue biotechnology[176].

In the Macaronesian sea basin, maritime-based activities constitute the backbone of the local economies. In particular, coastal tourism, cruise tourism, shipping (maritime transport and ports) and fishing and aquaculture have been identified as playing a pivotal role and are highly developed. Two activities are also at a pre-development stage and show a remarkable growth potential for the near future: renewable energy and blue biotechnology, which could create both significant job opportunities and value added for the sea basin economy[177].

[175] European Commission (2017, September). Realising the potential of the Outermost Regions for sustainable blue growth. Final Report https://ec.europa.eu/regional_policy/sources/policy/themes/outermost-regions/pdf/rup_2017/rup_sust_blue_growth_en.pdf
[176] Footnote 175.
[177] Footnote 175.

Challenges in the ORs include a general decline and an ageing workforce in the SSCF sector, the rise of the tourism industry which competes with fisheries for sea resources (this has led to excessive urbanisation in some islands), and insufficient capacity to add value to the local catches – the local tourism industry relies heavily on imported fish, while the local catches are not always valued properly both on local or outside markets.

The public sector is the cornerstone of blue economy development, not only in terms of financial support, but also for developing a holistic vision and organising the maritime economy in each OR. Decision-making processes cannot be efficient without good knowledge of the sector, which is not a given for these territories. In fact, data gaps are significant, even for the tourism sector (and for fisheries, see above), as well as for general socio-economic indicators.

The ORs can reflect on the experience of CLLD, where implemented, to foster the sustainable development of the blue economy at local level.

During 2014-2020, 10 FLAGs are active in the ORs, 7 in Spain (Canary Islands) and 3 in the Portugal (Azores). Given that they are relatively small islands, their average area is only 1 015 km², roughly half the EU average. The average population is 134 186 people, slightly higher than that for all sea basins, which indicates a relatively high population density of 134 people per km². The fisheries sector employs on average 312 workers in each FLAG area. The fleet is mostly SSCF and there are several marine protected areas (MPAs) around these remote territories.

Receiving on average an EMFF contribution of EUR 709 623 during 2014-2020, these FLAGs have a total budget of EUR 709 623, much lower than that of all FLAGs. Their strategies are generally focused on: (i) improving the processing and marketing of local fish products, in particular targeting the tourist trade; (ii) developing sea-based activities linked to fishing such as pescatourism; (iii) promoting the local fisheries-based heritage; (iv) undertaking activities aiming at reducing conflicts between the fisheries sector and other users of the marine space; and (v) addressing locally the consequences of climate change.

INLAND AREAS

1. Scope

27 EU Member States.

2. Ensuring a sustainable management of natural resources

Commercial inland fishermen are often involved in managing the aquatic ecosystems they exploit. It may be a voluntary decision, but in some cases it is an obligation linked with the granting of fishing rights.

The most frequent action of commercial fishermen is to participate in fish stock management, usually through restocking plans. Such measures are usually carried out in lakes and reservoirs, where the introduced fish are likely to stay and to get caught by fishermen. It is a technique used for example in French Alpine lakes, in Bulgarian reservoirs and in Lough Neagh in Northern Ireland. In some cases, such as in France, it is a facilitation of the natural process: breeding individuals are caught from the lakes, reproduction is controlled in hatcheries, and young fish are sent back to their lake. In other fisheries, like in Lough Neagh, restocking is essential if exploitation is to be sustainable. Thus wild fry from other areas (like elvers caught in France) or raised fish are introduced into the fishing grounds to continue the fishery. In Sweden, fishing rights are often connected to the land bordering the lakes. In Lake Vättern, ecosystem-based co-management has been established with the support of EMFF CLLD funds, and contributes to the sustainable exploitation of the lake's fish resources.

Another way of managing the fish population is to remove undesirable species, usually invasive species with no commercial value. In Brandenburg and Berlin, the targeted removal of ecologically undesirable mass species, which are not marketable either as fish for consumption or for stocking purposes, is subsidised. This group, called *Futterfisch* (trash fish), includes mainly bream, white bream and roach, and accounts for the largest portion of the catch volume.

Fishermen can also actively take part in aquatic ecosystems monitoring. Some scientific programmes already involve fishermen as data collectors of fish stock (DE, FR, NL). Fishermen are generally paid to play this role, and this could represent a significant share of their revenue.

3. Improving enforcement and control of fisheries and the provision of data

3.1 Collection of scientific data

Data collected for inland areas relate to diadromous species and socio-economic aspects of fish processing and aquaculture. To explore further data collection opportunities, the current EU Multiannual Plan includes pilot projects on some environmental and social data from aquaculture. Specific data collection challenges stem from differences in approach and methodologies applied by Member States, as well as different arrangements for fishing and conservation of diadromous species.

Data for inland fisheries are scarce in most Member States and at an aggregated EU level. Further, there are no systems for monitoring the economic performance of inland fishing firms

in the EU and very few relevant studies have been carried out. There is also scope for improving methodologies applied by Member States to inland fisheries[178].

3.2 Enforcement and control

Unlike marine aquatic resources which are managed under the CFP, the control of inland fisheries (both commercial and recreational) is governed by Member State legislation. Hence, in principle, the Commission is not involved in the monitoring and control of inland fisheries. However, the CFP and the Control Regulation do apply to anadromous and catadromous species during the marine part of their lifecycles and may also apply during the freshwater part of the lifecycle in cases where the species is subject to a management plan (such as the management plan for European eel under Council Regulation (EC) No 1100/2007).

Some control challenges related to inland fisheries should be addressed. Firstly, in some Member States, certain vessels perform fishing activities in both marine and inland waters. To keep track of such vessels, Member States must implement an effective vessel monitoring system covering both marine and inland fishing activities. Also, for fishing activities in estuaries, it may be a challenge for control authorities to clearly distinguish marine fishing from inland fishing. Improved marking of fishing gears and modern surveillance equipment can be part of the solution. Finally, as concerns anadromous and catadromous species, an effective way of ensuring effective control of inland fisheries would be to establish management plans covering both the marine and freshwater parts of the lifecycle.

4. Ensuring a balanced socio-economic outlook for the fisheries sector

Commercial inland fishing employs about 10% of EU fishermen (in numbers, since FTE is not monitored everywhere). Its contribution to EU market supply is low, accounting for less than 1% of the overall catch volume of the EU fishing fleets. Reliance on inland fishing is far more important in some specific areas, however, such as the Danube delta, lake areas in Scandinavia and the Baltic States, sub-Alpine lakes, etc. Moreover, the socio-economic impact of commercial inland fisheries goes beyond the simple tally of jobs and catch across the EU. As a traditional activity, inland fishing has a high heritage value in regions near inland waters, where fishing has provided a living for many people and is deeply rooted in the local culture.

The most recent study of inland fisheries dated 2011[179] states that, based on information provided by Member States and experts, approximately 17 100 people are involved in commercial inland fisheries in the EU. The Member States with the most inland fishers are Italy, Romania, Bulgaria, the UK, Estonia, Finland, Portugal and Germany. Romania and Bulgaria are two Member States with a very large number of fishers connected with traditional domestic consumption of freshwater fish. Finland, with its large lake fisheries, is one of the Member States most directly involved in inland fishing. In Romania and Finland, at least half of all fishers are inland fishers. Inland fishing often involves significant part-time activity, due to the existence of fishing seasons. In addition, in several Member States, it is possible to purchase a professional licence for leisure fishing and those numbers may be significant in Germany, Portugal and Spain.

In the past, around 14 000 fishing boats have been operational in the EU's commercial inland fisheries, which represented 16% of the whole EU fishing fleet. Most of these boats are less than 8 metres in length and operate with passive gear, in some cases without an engine (rowboats). Some large natural lake fisheries (Finland, Estonia, etc.) are exploited by larger

[178] An ongoing project is looking at data collection and statistics for inland fisheries in several EU Member States with the goal of developing common EU guidelines (www.luke.fi/projektit/infish/).
[179] https://ec.europa.eu/fisheries/sites/fisheries/files/docs/publications/inland_fisheries_en.pdf

boats with active gear (trawls or seines). Fishing without a boat (from shore or pontoons) takes place in some small local traditional fisheries (eel and salmon) and seasonal fisheries in Northern Member States (fishing on ice in the Scandinavian and Baltic States).

The overall catch for commercial inland fishermen was estimated at about 35 000 tonnes in 2007-2008 for a value of EUR 100-110 million (at first sale). Average prices and the total value of catches are higher in the Western Member States, where the remaining inland fisheries focus on the most valuable species. 89% of catches are freshwater species, 6% eel and 5% other diadromous species. In Romania, inland fisheries represent a large majority of all catches and in Bulgaria, around 10%. For the other non-landlocked Member States, it represents 3% or less.

The specificity of the sector is that most freshwater fish targeted by inland fishers corresponds to local traditional demand or to specific markets (such as glass eel for restocking and aquaculture, eel for the smoking industry). Most of the volume of freshwater fish landed is sold to local dealers and wholesalers or directly to consumers by fishermen (or their organisations). They also principally supply regional and national markets. Some species are exported to other Member States and/or to foreign countries (pike perch fillets from Estonia; glass eel from France and the Netherlands, yellow eel from Northern Ireland).

There is no information on fishers' revenue composition for most of the commercial inland fisheries. Apparent average income per fisher can only be assessed through overall value of catch/number of jobs. Specific studies (France) and some case studies (interviews with fishers and their organisations) allow analysis of the breakdown between operating costs and revenue.

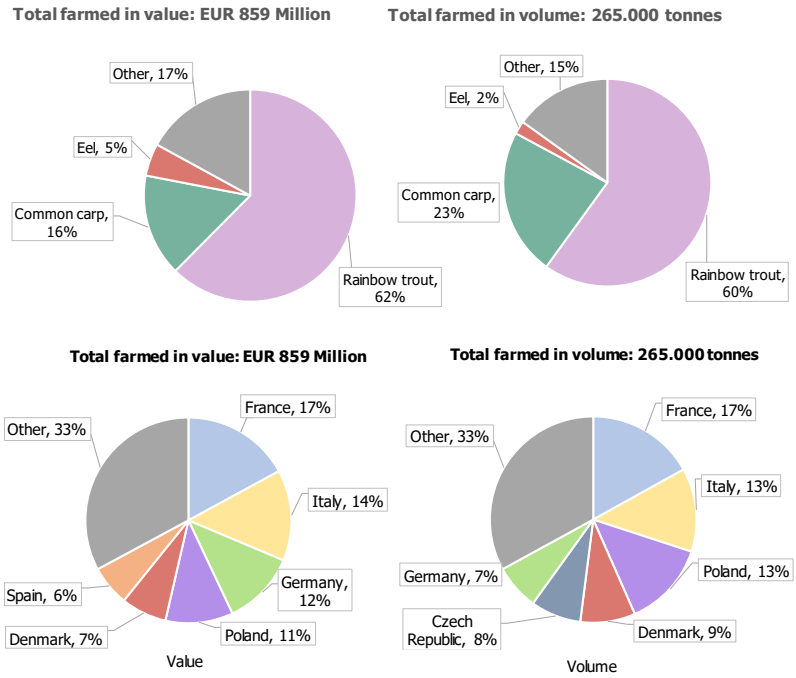
Average productivity and turnover (catch value) per fisher appear to be very different depending on the fisheries, from less than EUR 2 000 in Bulgaria and Romania up to EUR 35 000-40 000 in Austria and Sweden. However, the apparent average in each Member State may be substantially affected both by fishers' level of activity (data on FTEs are rarely available) and by underestimates of catch value (some very valuable products, such as fish roe, are not always taken into account in the statistics, as in Romania).

The average income accounts for more than 50% of turnover (and often up to 75%) in the small-scale fisheries that use passive gear. In most fisheries using active gear, income/turnover is often under 50%. The average income of inland fishers is decreasing in most Member States, stable in a few and increasing in only two Member States: Ireland, where the virtual collapse of inland salmon fishing has led to a significant increase in prices for wild salmon (demand still exceeds supply capacity), and Sweden, where lake fisheries are sustainable and where there is an effective marketing strategy in place (export of pike and pike perch to other EU markets).

5. Promoting a sustainable and profitable aquaculture

The main freshwater species farmed in the EU are rainbow trout (60%) followed by common carp and eel. The main producing countries are France, Italy and Poland in volume, and Germany in value. The economic performance of the freshwater sector is mainly dependent on the production of rainbow trout and common carp, which account for 57% and 18% of total value in the freshwater segment.

Freshwater aquaculture production



Strengths

Trout aquaculture production and carp production have distinct economic and employment characteristics: trout aquaculture is mostly obtained from intensive technologies, whereas carp producers use more extensive technologies. The highest salaries were reported in Denmark and Finland, where intensive trout aquaculture dominates. The lowest salaries were paid in Bulgaria and Romania, where extensive carp production dominates.

Carp pond aquaculture also offers environmental and cultural services (flood control, biodiversity and landscape preservation) so there is an interest in maintaining this type of fish farming.

Challenges

Only 2 of 10 Member States producing freshwater trout have reported a positive future expectations indicator.

The production and consumption of carp remains highly seasonal, resulting in a limited range of products in the market. The analysis and evaluation of the overall performance of the carp sector by segment can only be done partially due to the limited data and to differences in segmentation within DCF and EU MAP data. Based on data for a limited number of Member States (Bulgaria, Croatia and Spain), net profit margins between 2012 and 2014 were negative. However, in 2015-2016 profits ranged from 8% to 14%.

The price of farmed common carp in the EU showed a decreasing trend up to 2014 and a slight rise in the following 2 years. It is almost twice as high as the price on the world market. These differences are likely to reflect the difference between European and Asian consumer income and the incorporation of lower value cyprinid species (big head carp, silver carp and grass carp) within the world price for carp (FAO).

The freshwater trout sector is facing difficulties. The figure below shows the economic performance indicators for trout aquaculture (all segments) for 2008-2016. In 2016, turnover declined by 8% against 2015, to EUR 343.8 million. Total operating costs decreased by 17% against 2015, leading to an increase of net profit margin from -2% in 2015 to almost 9% in 2016. The average prices of freshwater rainbow trout trended upwards between 2008 and 2014,

with a minimum in 2008-2009 (EUR 2.8 per kg) and a maximum in 2014 (EUR 3.3 per kg). However, in 2015-2016 the average price decreased again to EUR 2.8/kg.

Turnover and total operating costs in EUR million, GVA (gross value added) and net profit margin in %

One of the reasons for the low competitiveness of the sector is that the largest share of carp and trout sold is still whole and fresh. In order to increase profitability and competitiveness, modernisation of enterprises, adapting to changes in consumers' expectations (developing a wider range of consumer products through further industrial processing) and diversifying from traditional ways of farming seem to be the main priorities, through diversification and adding value of products, better organisation of producers and better consumer information.

Space and water use are among the main obstacles to expansion of the sector. With regards to space, competition from other industries on land use and issues of acceptability have been preventing new farms from emerging in some Member States. For water, new investments seem to be hampered by regulations and limited access to new inflow water licences. The application of the Water Framework Directive is a challenge for already established inland freshwater aquaculture and often requires large investments. Natura 2000 sites are also a challenge for aquaculture production, due to strict production requirements. The economic impact of drought/reduction of water due to high temperatures is a major issue. Finally, producers also report on the high impact of predators, notably cormorants, on the viability of the sector.

Finally, few EU freshwater farms have obtained 'disease-free status' under EU animal health legislation[180]. Most of the EU farms only have Category III disease status (undetermined), mostly due to lack of coordinated efforts by the different farmers in the same river basin.

Freshwater aquaculture has potential for diversification, and polyculture in ponds also offers interesting opportunities.

The establishment of transparent environmental monitoring plans and the reporting and collection by competent authorities of data on environmental indicators of aquaculture activities (inter alia, discharges and emissions (organic matter, nutrients, veterinary medicines) and water exchanges) is important to limit the environmental footprint of aquaculture systems and ensure their social acceptance.

[180] Council Directive 2006/88/EC. According to Annex III of this Directive, Category III corresponds to 'Not known to be infected but not subject to surveillance programme for achieving disease-free status'.

6. Enabling climate change adaptation and mitigation

In the short term, climate change is likely to impact inland fisheries by incremental changes in water temperature, nutrient levels and lower dry-season water levels. Understanding how freshwater ecosystems will respond to future climate change is essential for the development of strategies and initiatives needed to protect aquatic and riparian ecosystems. The future status of freshwater ecosystems is also dependent on changes in land use, pollution loading and water demand. A project supported by the EU 7th Framework Programme for Research and Innovation[181] identified a number of measures that have the potential to (i) reduce the sources or enhance the sinks of greenhouse gases, (ii) decrease the vulnerability of water resources and aquatic ecosystems to climate change, and (iii) enhance the knowledge base on climate-water relationships and increase societal awareness of this matter. Climate challenges are similar in inland fisheries and aquaculture throughout the EU, and can be addressed by the future EMFF by setting up climate adaptation and mitigation measures in a strategic way.

7. Fostering the local development of a sustainable blue economy

Inland areas can reflect on the experience of CLLD to foster their sustainable development.

In 2014-2020, 94 FLAGs are active in inland areas, which represents 26% of the total number of FLAGs. They are located mostly around the Baltic Sea and cover an average area of 3 730 km^2, significantly higher than the 2 277 km^2 average in all sea basins. The mean population is 107 826 people, close to that of all sea basins. The fisheries sector employs an average of 242 workers in each FLAG area, distributed between the catching (28%), aquaculture (33%) and processing (39%) sectors. Inland fishing is undertaken almost exclusively by SSCF vessels. Aquaculture is also a prominent sector in inland areas.

Receiving an approximate EMFF contribution of EUR 1 340 798 during 2014-2020, inland FLAGs have a typical budget of EUR 1 784 870, close to the average for all FLAGs.

Challenges in inland areas include:

- the lack of integration of fisheries with the rest of the territory, usually a rural area;
- the lack of networking opportunities due to the marginal importance of fishing in the local economy;
- competition from recreational fishing and other forms of tourism linked to fishing;
- lack of marketing opportunities for freshwater fish species, which are less in demand than seawater species;
- insufficient processing of products to meet consumers' new demand for processed products (e.g. fillets).

Opportunities for inland FLAGs include:

- possible cooperation with other similar inland areas;
- undertaking exchanges of experience and best practices;
- better linkages with the tourist industry via specific products – quality labels for local fish products, bed and breakfast, recreational fishing, etc.;
- better marketing of freshwater fish species;

[181] Adaptive Strategies to Mitigate the Impacts of Climate Change on European Freshwater Ecosystems (REFRESH) https://cordis.europa.eu/project/id/244121

- promoting innovation, including species and product diversification.

Multi-funding could be used for the development of strategic multisector initiatives and complementary activities, such as local food products linking fish and other farm products (EAFRD), the development of tourism facilities near fishing spots (ERDF), or the retraining of some of the workforce in tourism (ESF).

ANNEX

EMFF toolbox

CHALLENGE	CORRESPONDING EMFF ACTIONS
1. Ensuring a sustainable management of natural resources *1.1. Applying the precautionary approach and achieving MSY*	Support from the EMFF for the achievement of this objective should complement the conservation measures implemented under the CFP. In particular, the following actions and investments should be considered: ▪ **Improving knowledge of marine ecosystems to allow efficient management decisions based on the best available scientific advice.** There is room for improving data collection on the impacts of fisheries on the ecosystems (by-catch of protected species or non-target species) under the Data collection framework. Beyond this, pilot projects, scientific cooperation and local initiatives on improving scientific knowledge of the ecosystems should be encouraged to strengthen the basis for ecosystem-based management of fisheries. EMFF support could also be considered to develop partnerships between fishers and scientists. ▪ **Developing fisheries conservation measures.** Achieving MSY relies on effective management decisions and conservation measures adopted under the CFP, including measures under multiannual management plans and regional/international cooperation. The EMFF can support the design and implementation of these measures, for example their technical and administrative costs. This might also facilitate joint recommendations in the context of regional cooperation.
1.2. Implementing the ecosystem-based approach to fisheries management	EMFF support for the following actions and investments should be considered: ▪ **Fostering innovation in low-impact fishing techniques.** The EMFF should be used to conduct pilot projects, trials and tests for the development of innovative fishing techniques, and allow the dissemination of results. Collective projects – for example managed by producer organisations or other fisher organisations – could play a role, to ensure dissemination of innovation in the sector. This should allow individual fishers to decide on their investment strategies, with extensive knowledge of the available innovations. ▪ **Boosting the use of low-impact fishing techniques on board.** The transfer of innovation to investments on board that reduce the environmental impact of fishing techniques is essential. Possible changes include, for example, shifting from active mobile gear such as heavy trawls and dredges to passive gear such as fish traps. Techniques can also include limiting specific types of fishing in areas where certain animals aggregate and are more vulnerable to fishing. Other types of solution could be relatively simple technical changes, such as rolling out hookpods to longline fishing vessels to minimise by-catch of seabirds, or the use of coloured LED lights to stimulate an escape response in certain unwanted fish species. The EMFF should be used for this purpose and to assess whether and why fishers do not invest in new techniques, and thus help develop targeted eligibility rules and

selection criteria for EMFF support, based on the actual needs of the sector. The use of financial instruments or simplified cost options could be considered to simplify the delivery of support to beneficiaries.

- **Developing conservation measures in accordance with the ecosystem-based approach.** Reducing the negative impacts of fishing activities on the marine ecosystem relies on effective management decisions and conservation measures adopted under the CFP, including measures under regional/international cooperation. The EMFF can support the design and implementation of these measures, for example their technical and administrative costs. The EMFF could also be used to involve stakeholders in the development and implementation of local conservation measures or measures emanating from fisher organisations, for example within co-management schemes.

- **Collecting waste fishing gears.** Under the Directive on the reduction of the impact of certain plastic products on the environment, Member States must set up a national minimum annual collection rate of waste fishing gears containing plastic for recycling. The EMFF can support action that contributes to this objective.

The landing obligation implies significant changes in fishing practices for the sector, allegedly with significant financial costs related to the acquisition of equipment or on-board and on-land adaptations.

Structural investments supported by the EMFF are necessary to facilitate compliance with the landing obligation both on board and on land:

- **Improving gear selectivity.** EMFF support to foster innovation and investments in more selective gears should be a priority, particularly in mixed fisheries. While all stakeholders have clearly identified selectivity as a key challenge, the very low uptake of support for this purpose under the 2014-2020 EMFF is a concern. It is therefore essential to identify the reasons for this low uptake and to raise the sector's awareness of the long-term benefits of investment in selectivity, for example through communication campaigns. It is also essential to foster the involvement of fisher organisations, especially producer organisations, in order to facilitate collective projects and the dissemination of innovation. The use of simplified cost options or financing not linked to costs should be considered to simplify the delivery of support.

1.3. Eliminating discards and making the best use of unwanted catches

- **Adapting port infrastructures.** In addition to an overall improvement in selectivity on board, it is necessary to reduce the costs generated by the landing obligation in ports, for example the handling, storage and use of unwanted catches. The EMFF could therefore support investments in the infrastructures of existing ports and landing sites, also taking into account the need for security and improved energy efficiency.

- **Making the best use of unwanted catches.** EMFF support should be used to find outlets for unwanted catches, although without creating a market for catches below the minimum reference conservation size. This is a key action entrusted to producer organisations. In accordance with Article 15(11) of the CFP Regulation, the use of unwanted catches should be restricted to purposes other than direct human consumption, for example fish meal, fish oil, pet food, food additives, pharmaceuticals and cosmetics. EMFF support should also facilitate local partnerships aiming to give value to unwanted catches.

- **Mitigating any 'choke species' effect.** One of the main consequences of the landing obligation might be the early closure of certain mixed fisheries affected by the 'choke species' effect. Solutions need to be developed under the conservation policy. In this respect, the EMFF should support the collection of scientific data underpinning conservation measures, and the technical and administrative costs for the development and implementation of these measures, including in the context of regional cooperation.

1.4. Ensuring coherence with environmental legislation

In accordance with the ecosystem-based approach, the CFP should be coherent with environmental legislation. In this respect, the EMFF could contribute to **developing and implementing measures for the protection and restoration of biodiversity and ecosystems** in the context of the Birds, Habitat and Maritime Strategy Framework Directives, for example in the achievement of a good environmental status in the marine environment, the implementation of spatial protection measures, the management of Natura 2000 areas and the minimisation of impacts on protected species. EMFF support could also help foster local partnerships through community-led local development and allow an integrated approach to biodiversity protection in coastal areas.

Possible actions include the active restoration of seabed habitats, such as transplanting plants or corals to the degraded areas, or creating artificial nests to increase the use of certain coastal areas by seabirds. Investments in research and development on marine ecosystem restoration need to be scaled up. Oyster reefs, for example, are crucial biodiversity hotspots in European waters as they engineer ecosystems. Another example is the restoration of fish migration paths.

Managing MPAs is also a key challenge. Such management ranges from actions that completely remove all human activities (i.e. no-take zones) to areas that are open to human activities depending on how these impact the conservation objectives of the area. Therefore, MPAs can serve the purpose of restoring ecosystems, as well as maintaining a healthy system of human activities. An effective way to manage activities in MPAs is a management consortium approach (e.g. co-management) where local authorities work together with stakeholders and take joint decisions. It requires the proper financing of effective enforcement/surveillance activities, as well as empowering communities to care for the protection of the area. The costs related to setting up community-based management requires both supporting a functioning surveillance and enforcement system, and also covering the costs of representatives of different stakeholders, together with scientists, to meet as equals and take joint decisions.

2. Improving enforcement and control of fisheries and the provision of data

In order to effectively address the main challenges for fisheries control, Member States must invest in the **development and implementation of performant and innovative fisheries monitoring technology**. In this regard, EMFF support should be used to support the achievement of the following priorities:

- **Control and monitoring of the landing obligation** (investment in remote electronic monitoring systems including CCTV, sensor data, automatic recognition software, etc.);
- **Control of weighing** (such as investment in internet connected weighing systems and real-time transmission of weighing records);
- fisheries control risk management (for example investment in improved systems for data management and 'big data' analytics);
- **Maritime and inland water surveillance** (investment in drones and high-resolution satellite imagery and other types of modern surveillance technology);
- **Traceability** (investment in RFID, block chain technology/intelligent supply chains and similar technologies);

- **Monitoring and control of the small-scale fleet** (notably investment in low-cost handheld ERS and vessel positioning systems suited for the small-scale fleet);
- **Engine verification** (investment in devices and systems for continuous monitoring of engine performance).

Performant data management is also an important condition for a sustainable management of the fish stocks. In this respect, EMFF support can be used for the systematic **collection and validation of fisheries data for control purposes**, for example through investment in performant systems for data analysis, data cross-checking, data sharing and 'big data' storage.

Similarly, the availability of data used for scientific purposes (technical, biological, economic, social) is a condition for a science-based management under the CFP. Therefore, the EMFF should contribute to **improving knowledge on the situation of fish stocks**. The EMFF should be used to enable the collection of reliable and complete fisheries-related data under the Data Collection Framework (DCF). The ambitious DCF puts Member States' ability to meet these obligations to the test, notably as regards by-catches of non-target species and protected species, small- scale fisheries and recreational fisheries. This is the justification of continued and additional financial support in this field.

Both for control and scientific purposes, data management and technology gets more sophisticated and there is a need for expertise. Hence, investments in hardware and software need to be combined with a substantial support for **improving knowledge of innovative control technology and IT skills**, at all stages of investment projects (development, implementation, maintenance). Currently, many Member States still lack the human resources and knowledge to take full advantage of new and innovative data management and technologies in fisheries stock assessment (e.g. modelling), sampling design, ecosystem analysis and social sciences linked to fisheries. Staff training can be a means to increase competence. Training schemes for fishers using new control technologies are also necessary, and will help moving towards a culture of compliance.

3. Ensuring a balanced socio-economic outlook for the fisheries sector and strengthening resilience

The main drivers for resilience and profitability in the fishing sector are abundant fish stocks, high fish prices, low fuel prices, energy-efficient and technically efficient vessels and skilled fishers. Some of these factors do not rely on structural investments and are rather exogenous and, to a certain extent, cyclical. However, EMFF investments can help increase the resilience of the sector.

3.1. Providing conditions for an economically viable and competitive sector

- The EMFF should be used to **invest in fishing vessels without increasing their fishing capacity**. In particular, innovations and investments that aim to increase energy efficiency and the quality of catches are essential. Indeed, lower fuel consumption reduces operating costs and higher-quality fish increases sales prices. In this respect, digital technology is a key enabler for a resilient, sustainable and competitive sector.

- The EMFF should be used to **improve capacity building among stakeholders in the fishing sector** through feasibility studies, advisory services, impact assessments and pilot projects managed by collective beneficiaries and disseminated in the sector. These actions should help individual fishermen to identify innovation and business opportunities and adapt their fishing, investment and marketing strategies.

- Through financial engineering, the EMFF should mobilise **private investment** in the fishing sector. In order to enhance resilience and competitiveness, Member States should **unlock the use of financial instruments** for new investments expected to be financially viable, such as generating revenues or savings, and which do not find sufficient funding from market sources.

- EMFF support under CLLD should also be used to **diversify the income of fishers.** This includes the development of complementary activities in the local blue economy, for example in tourism, direct sales, environmental services and cultural maritime activities. The involvement of fishers in local partnerships with other stakeholders is essential to tap the full potential of the blue economy in coastal areas. Capacity building is a key challenge in this respect.

Under Article 22 of Regulation (EU) No 1380/2013, Member States must prepare an action plan for fleet segments with identified structural overcapacity, which must set out the adjustments targets and tools to achieve a balance between the fishing capacity and the available fishing opportunities. In this respect, the tools available in the EMFF should be fully used to support the structural adjustment and management of fishing capacity:

3.2. Addressing overcapacity

- EMFF support should be used to **collect the DCF data necessary for preparing the annual report on the balance between fishing capacity and fishing opportunities**. It is necessary to calculate the biological, economic and vessel use indicators set out in the common guidelines referred to in Article 22(2) of the CFP Regulation.

- EMFF support should be used to **develop fleet management measures**, including, where relevant, targeted transferable fishing concessions.

- EMFF support should be used to **implement permanent cessation schemes**. In the context of the implementation of these schemes by financing not linked to costs, it is necessary that the results and conditions set out in Appendix 2 of the programme are consistent with the adjustment targets set out in the action plans of the relevant fleet segments referred to in Article 22 of the CFP Regulation.

Under Article 2(5) of Regulation (EU) No 1380/2013, the CFP shall 'contribute to a fair standard of living for those who depend on fishing activities, bearing in mind coastal fisheries and socio-economic aspects'. EMFF support should be used to achieve these social and employment objectives:

3.3. Contributing to a fair standard of living for those who depend on fishing activities

- **Fostering human capital and skills in the fishing sector**, for example through professional training, lifelong learning and dissemination of knowledge and experience. Collective projects have a clear added value in this respect.

- **Attracting young people in the fishing sector** through educational and communication actions.

- **Improving health, safety, hygiene and working conditions in the fishing sector**. The main reason for accidents in the fishing industry is human error rather than the design and construction of unsafe boats. Due to the competitive environment in fishing, increased investment in speed and catching efficiency further aggravates the problems of safety and security on board because investment repayment drives the urgency to catch more fish. Therefore, increasing training on safety for fishers and skippers is an important investment opportunity to greatly reduce accidents at sea.

- **Enhancing gender balance in the fishing sector.** For example, supporting the inclusion in the value chain of life partners of self-employed fishers.

- **Facilitating social dialogue in the fishing sector** with the involvement off all relevant stakeholders.

4. Promoting a sustainable and profitable aquaculture

Aquaculture is dependent on clean marine and fresh waters. EU environmental legislation – in particular the Water Framework Directive, the Marine Strategy Framework Directive and the Regulation concerning use of alien and locally absent species in aquaculture – ensures that these preconditions are met and that aquaculture does not impinge on biodiversity. These high standards, together with those related to health and consumer protection that EU aquaculture activities have to comply with, have cost implications for producers. However, they can be turned into a competitive advantage if the attention of the consumers is drawn to quality and sustainability. They can also contribute to the local acceptability of aquaculture.

Article 34 of Regulation (EU) No 1380/2013 aims at the growth of an EU aquaculture which achieves these high standards. This provision establishes an open method of coordination (OMC): a voluntary process for cooperation among Member States facilitated by the Commission. As part of this, the Commission adopted Strategic Guidelines for the sustainable development of the sector in the EU, identifying main bottlenecks and recommending concrete actions. On the basis of these guidelines, EU Member States adopted Multiannual national strategic plans (MNAPs) that establish objectives and actions according to the particular situation of the sector in each country. According to the external evaluation of the OMC, progress has been achieved but further action is necessary. The adoption of reviewed Strategic Guidelines by the Commission is expected by the end of 2020. The Commission is currently working on these guidelines in consultation with EU Member State experts and with the Aquaculture Advisory Council. These guidelines should identify priority areas and action for furthering the development of the sector in a way that ensures a more competitive and sustainable aquaculture production in the EU. The Commission has also invited EU Member States to update their MNAPs. To fulfil the potential of the EU aquaculture sector, all relevant players should be engaged: authorities, producers, retailers, consumer associations, researchers, and civil society.

The EMFF should be used to achieve the following objectives:

- **Simplifying administrative procedures.** Administrative burdens remain a key obstacle to the development of aquaculture in EU Member States. It is essential to streamline procedures for licensing of new farms and renewal of licences, while ensuring that the relevant environmental legislation is complied with. The EMFF can support the administrative costs of the relevant authorities in the Member States when improving their management and regulatory system in this regard.

- **Supporting coordinated spatial planning.** Spatial planning can help reduce uncertainty, facilitate investment and speed up the development of aquaculture, while ensuring that such development will be made with full respect for the environment. The lack of space and access to water often cited as an obstacle to the expansion of EU aquaculture can be overcome by identifying the most suitable sites for the expansion of EU aquaculture production. In this regard, spatial plans should take into account the environmental services provided, for example by extensive

pond-based aquaculture or aquaculture in wetlands in terms of preserving landscapes, habitats and biodiversity, as well as providing climate change mitigation services (water retention, coastal protection). The EMFF can support Member States' administrative and technical costs in the development of coordinated spatial planning to ensure that aquaculture's potential and needs are taken into account, and secure an adequate allocation of space in waters and land for sustainable aquaculture development. The EMFF can also support the restoration of abandoned aquaculture facilities or the conversion of other facilities into aquaculture.

- **Promoting sustainable aquaculture practices**, for example the farming of lower trophic species (such as shellfish, algae or invertebrates), integrated multi-trophic aquaculture, the use of renewable energy, organic production, recirculation and nutrient capture systems, waste management with a circular economy approach, good practices on animal welfare, biosecurity systems reducing the use of veterinary medicines, and the replacement, reduction and recycling of plastics used in aquaculture (e.g. ropes, feedbags, containers). Setting up installations for recirculation and nutrient capture systems, and the recycling of nutrients in aquaculture farms, entails upgrading existing farms by installing more modern equipment (pumps, filtration, etc.) or circulation systems allowing for the reuse of water and reduction in energy costs. The benefits are wide-ranging, from environmental benefits such as decrease in water pollution to economic benefits such as reduced water costs and additional income generated by growing an additional crop (e.g. fruits and vegetables farmed in an aquaponics system) or species (e.g. mussels or seaweed). Furthermore, such investments also enable aquaculture farmers to interact in different fields of knowledge and gain skills beyond fish farming, for example in engineering and agriculture. Other technological investments can help aquaculture facilities become more energy sustainable. For example, solar panels can be installed on buildings, and the surplus energy generated sold, further diversifying a farmer's income.

- **Boosting the competitiveness of aquaculture farms.** The EMFF can support the conditions for business development through:
    - market-driven research, innovation and knowledge transfer with the participation of the aquaculture industry,
    - the developmment of skills covering the needs of the aquaculture sector,
    - productive investments aiming to improve the competitiveness and resource efficiency of aquaculture farms (for example energy efficiency and reduction of the use of water, chemicals and antibiotics or collection and use of by-products),
    - stock insurance schemes that safeguard the income of producers in the event of exceptional production losses due in particular to natural disasters, adverse climatic events (e.g. drought), sudden water quality changes, diseases or pest infestations or the destruction of production facilities,
    - communication on quality and environmental and health standards of aquaculture, including through quality labels and certifications,
    - establishment of producer organisations and inter-branch organisations, as well as transnational cooperation of producer organisations. Support to production and marketing plans and communication campaigns by established producer organisations (see also below),
    - promotion of good practices on animal health and welfare among farmers, in order to better prevent and manage diseases

and increase productivity, and reduce the use of veterinary medicines.

- **Contributing to the protection of biodiversity and fostering business opportunities in environmental services.** Certain types of aquaculture (e.g. extensive fish pond aquaculture widespread in particular in Central and Eastern Europe or extensive aquacutlure in wetlands) helps maintain economic activity and preserve landscape and biodiversity in sometimes remote areas. However, the competitiveness of this type of aquaculture remains limited. In this regard, the EMFF can be used to add value to projects, services, production methods and species and product diversification, which can result in higher competitiveness for this type of aquaculture.

- **Preventing serious damage by predators.** One important factor affecting aquaculture production (notably in ponds) is related to predators, in particular cormorants. Under the derogation system set out in the Birds Directive to protect the interests of fisheries and aquaculture, the EMFF can be used to support schemes aiming to prevent serious damage by predators to aquaculture.

- **Tapping the assets of coastal and inland areas**. The growing expectations from consumers for quality and diversity of food products, especially if locally produced, offer opportunities to aquaculture farmers. Coordinated action at local level between entrepreneurs, public authorities, associations, research, education and training organisations can help stimulate local economies and meet the growing demand for locally, sustainably produced seafood. Business diversification supported under CLLD may provide additional sources of income for farmers. Furthermore, the integration of aquaculture with other economic activities, such as angling, tourism or fisheries, can provide business opportunities for aquaculture producers as well as increase the acceptability of aquaculture actitivies by local communities.

5. Improving the value chain and marketing of fishery and aquaculture products

The market value of fishery and aquaculture products is an important driver for profitability. In accordance with the objectives of the market policy for fishery and aquaculture products, the EMFF should contribute to the transparency, stability, quality and diversity of the supply chain, and to the improvement of consumer information.

In this respect, the EMFF should be used to support the following actions and investments:

- **Implementing the Common Market Organisation (CMO).** In particular, it is essential that the organisation of the sector and its structure through the creation and support to producer organisations are supported, given their key contribution to the objectives of the CFP, the expenditure incurred to meet their legal obligations (from the CMO) and the existence of market failures. EMFF support should allow producer organisations to make full use of their production and marketing plans, which are effective and flexible tools to support an increasingly market-based approach in fishery and aquaculture management and allow producer organisations to act in line with the objectives of the CFP. Support for the creation and restructuring of professional organisations under the CMO, including transnational organisations and inter-branch organisations, and the restructuring of

collective organisations into professional organisations, should also be encouraged.

- **Improving the conditions for marketing fishery and aquaculture products.** The EMFF should facilitate the placing on the market of products, improve their quality and diversity, diversify the supply chains, develop outlets for under-valued or underutilised catches and aquaculture species and tap the potential of new technologies in the marketing process. It can for example support market surveys and studies and private-public promotional campaigns.

- **Enhancing traceability and consumer information.** For example, the EMFF can support measures that provide voluntary information to consumers and help to add value to products. It can also foster short food circuits and direct sales to give additional value to high quality and extra-fresh local products.

- **Conducting communication campaigns** to raise public awareness of fishery and aquaculture products, fish consumption and fisheries sustainability.

Support under community-led local development should also be used to **develop market outlets in the broader blue economy.** Synergies with tourism and restaurants in coastal areas can for example generate additional value.

6. Enabling climate change adaptation and mitigation

Tackling climate change is a key commitment of the Union in the context of the Paris Agreement and the United Nations Sustainable Development Goals. In this context, 30% of the overall budget of the EMFF is expected to support actions that contribute to the achievement of the Union's climate objectives. Such contribution is monitored according to the methodology laid down in the EMFF Regulation.

The EMFF can contribute to:

- **Reducing the carbon footprint of fisheries.** Financial support can help moving to more CO_2-efficient fishing. This is possible by switching to lower-carbon fuels such as LNG (25% lower CO_2 emissions) or LPG (15% lower), and by developing hybrid-electrical propulsion. For the longer term, the EMFF can support preparatory research on the integration of fishing vessels into the carbon-neutral energy economy, such as hydrogen fuelling. Further CO_2-efficiency gains could be made by switching to alternative fishing methods and by more efficient equipment on fishing vessels (insulation, propulsion, ancillary equipment). The EMFF can also be used for these purposes in the replacement and modernisation of engines.

- **Adapting fisheries to the consequences of climate change.** Climate change is likely to challenge fisheries management in two ways, which are both difficult to predict. Firstly, fish stocks may move out of their traditional areas of distribution such that a mix of TACs set according to traditional relative stability would no longer reflect the real abundances of fish in catches. Secondly, warming waters may permit the ingress of wholly new species in certain areas (e.g. anchovy in the southern North Sea), either as new resources or as replacements for parts of the existing ecosystem (e.g. lizardfish from the Red Sea replacing hake in the Mediterranean Sea). The EMFF can be used to collect and process scientific data, develop a better scientific understanding of these trends, support the development of new

management mechanisms and help fishers adapt their fishing strategies and methods to these challenges.

- **Reducing the carbon footprint of aquaculture and promoting carbon capture in the sector.** In particular, the EMFF can be used to promote:
    - Algae and shellfish and other invertebrates production (low trophic, no need of feed and potential to absorbing nutrients in water and capture carbon).
    - The substitution of current feed sources (fish meal, fish oil and land-based crops such as soya) by other feed sources (e.g. seaweed, insects, fish waste).
    - Integrated Multi-trophic aquaculture (IMTA) systems with a high potential to offset the carbon/nutrient footprint.
    - Technology improvement and shift in energy sources through investment in tanks, ponds, raceways, recirculating aquaculture systems and photobioreactors.

- **Strengthening the resilience of aquaculture to climate change and promoting aquaculture that helps to mitigate the impacts of climate change.** In particular, the EMFF can be used to promote:
    - Practices and species adaptation and production diversification to decrease reliance on a limited number of species.
    - Health and disease management under a climate change scenario (this includes management of unforeseen diseases/parasites due to change in temperature ranges, issues of decalcification of shellfish species, higher proliferation of harmful algal blooms, alternative sources of feed, etc.).
    - Resilience to extreme events and variable conditions (particularly relevant for offshore aquaculture) and adaptation of coastal-dependent aquaculture which might be heavily impacted by climate change (e.g. clam production).

- **Improving the substitution of current protein and energy sources** by increasing production of aquaculture species that have minimal carbon footprints (particularly algae and shellfish and other invertebrates), and relieve pressure on land and freshwater resources.

- **Reducing food waste through improvements in seafood processing and marketing** (30% of Europe's seafood is currently wasted).

- **Conserving and enhancing coastal ecosystems** in accordance with the ecosystem-based approach. Coastal and marine ecosystems such as seagrass meadows or intertidal saltmarshes sequester and store large quantities of carbon (without causing more acidification) in both the plants and the sediment below. These ecosystems store more carbon per unit area than some terrestrial forests and are recognised for their role in mitigating climate change. Stopping the continuing degradation and loss of those ecosystems alone would reduce atmospheric CO_2 equivalent to the emissions from 700 coal-fired power plants per year. In addition, they protect the coastline from erosion and sea level rise, therefore contributing to adaptation. The EMFF can support the preservation of these ecosystems, including through sustainable aquaculture production.

7. Fostering the local development of a

Under CLLD, local partnerships design and implement integrated development strategies. These strategies are designed to build on the community's social, environmental and economic strengths and assets. They are drawn up at local

sustainable blue economy

level to maximise the participation of the relevant sectors in sustainable development of the blue economy by ensuring that the local community fully exploits and benefits from their potential. The Local Action Groups (LAGs) are key to the animation of these local strategies.

EMFF support under CLLD can contribute to the following:

- **Enhancing local partnerships** by involving the local community in the local development strategy. Bringing together the private sector, research and innovation institutions, local authorities and civil society organisations under a local strategy will help develop responses to specific needs and opportunities identified locally. This will also foster capacity building and cooperation in local communities.

- **Fostering diversification in local communities**. In order to broaden the activity of local fishing and aquaculture communities, CLLD strategies should support diversification inside or outside commercial fisheries as well as supporting lifelong learning and job creation. In this respect, eco-tourism can be an important economic sector for coastal areas and can be a desirable and profitable alternative source of job opportunities through the creation of synergies between different activities (e.g. fisheries and aquaculture and tourism). Fishers can also join schemes that train and employ them as MPA rangers. They can also be retrained to assist with the maintenance of offshore wind farms or with the collection of data for research programmes. A circular economy approach integrating different economic activities and where a waste for an activity is a resource for another is also a promising approach (e.g. blue bioeconomy). In this regard, the possibility of creating blue economy clusters and forging partnerships between companies, public institutions and research and innovation centers should be further explored.

- **Promoting economic, human, social and cultural assets**. Funding should be used to boost social well-being and support to cultural heritage in fisheries and aquaculture areas. It should be targeted at creating employment and new economic activity as well as improving the quality of life in areas affected by a decline in fishing activities or by other specific challenges hindering the viability of local fisheries and aquaculture communities.

- **Improving environmental protection** and capitalising on the opportunities available to local communities while protecting the local and blue environment, including mitigating climate change.

The EMFF can also support the implementation of priority actions identified in the framework of sea basin and macro regional strategies.