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Feeder Report 2021 - Fisheries

Introduction

1.1 This paper summarises the status of commercial fisheries within the OSPAR Maritime Area and measures taken to manage its environmental impacts. It briefly notes key messages from the Quality Status Report (QSR) 2010 (/en/ospar-assessments/quality-status-reports/quality-status-report-2010/) and Intermediate Assessment (IA) 2017, (/en/ospar-assessments/intermediate-assessment-2017/) and reports on progress since then. Recreational fisheries are not discussed in this paper, as these are covered in the feeder report on tourism and recreation; the UN Food and Agriculture Organisation (FAO) landings data cited in this report may, however, include some recreational landings if provided by contributing nations. Nor does it cover capture of whales or other aquatic mammals.

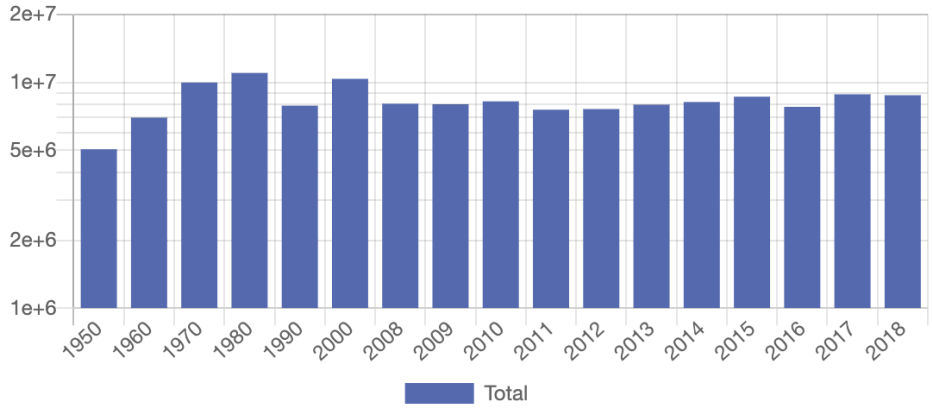
OSPAR QSR2023

(/en/ospar-assessments/quality-status-reports/qsr-2023/)

Distribution, Intensity and Trends

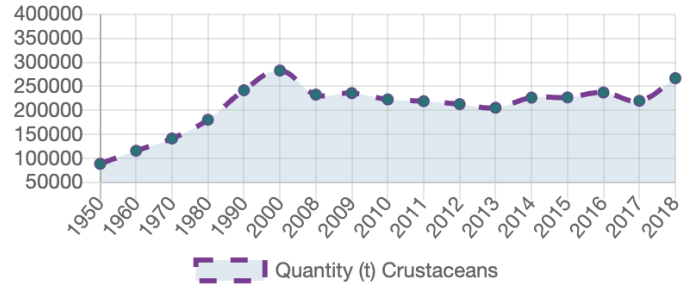
2.1 FAO data indicated that the total reported marine fisheries landings in the North-East Atlantic in 2018 was 9,32 million tonnes[1] (/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/fisheries/#1) , around 11% of the global figure of 84,4 million tonnes. This quantity has dropped since a peak of 13 million tonnes in 1976, since when landings fell, recovered in the 1990s and stabilised at about 70% of the peak. In 2017, 79,3 percent of the assessed stocks in the area were fished within biologically sustainable levels (FAO, 2020a).

Figure 1 Total capture production[2] of fish in the North-East Atlantic, 1950-2018



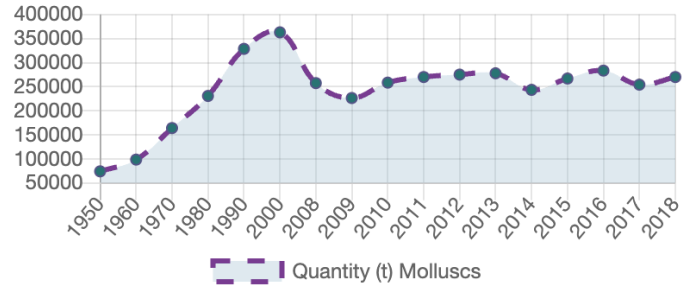
Unit: Tonne (Source FAO 2020b). [2]FAO capture production database covers volume of fish catches reported as landed by country or territory of capture, by species or a higher taxonomic level, by FAO major fishing areas, and year for all commercial, industrial, recreational and subsistence purposes.

Figure 2 Total capture production of crustaceans in the North-East Atlantic, 1950-2018



Unit: Tonne (Source FAO 2020b)

Figure 3 Total capture production of molluscs in the North-East Atlantic 1950-2018



Unit: Tonne (Source FAO 2020b)

2.2 Norway had the largest capture production of OSPAR countries fishing in the North-East Atlantic in 2018, at 2,28 million tonnes. Iceland was the second largest, at 1,26millon tonnes, followed by Denmark (0,79 million tonnes), the United Kingdom (0,69 million tonnes), the Faroe Islands (0,66 million tonnes), France (0,40 million tonnes), the Netherlands (0,39 million tonnes) and Spain (0,31 million tonnes). The Russian Federation's total was 1,05 million tonnes (FAO, 2020b).

2.3 EMODnet has maps of the movements of fishing vessels in the OSPAR Maritime Area (EMODnet, 2020).

Map data: © OSPAR Commission | Tiles © Esri — Sources: GEBCO, NOAA, CHS, OSU, UNH, CSUMB, National Geographic, DeLorme, NAVTEQ, and Esri

Figure 4 EMODnet Human Activities Vessel Density Mapping - Fishing, 2019
https://odims.ospar.org/layers/geonode:2019_yearly_rd_02
(https://odims.ospar.org/layers/geonode:2019_yearly_rd_02)

ICES Summary Overviews

2.4 Analyses of fishing activity are available in the International Council for the Exploration of the Sea's (ICES) summary overviews of fisheries in different ecoregions of the North-East Atlantic (ICES, 2019a – 2019f). These provide information on the national fishing fleets in the ecoregion, including gears and fishing patterns; the status of fisheries resources, and their level of exploitation; the impacts of fishing gear on subsurface and bottom habitats; and on

bycatch of protected, endangered and threatened (PET) species. They include graphs or maps on trends in landings, fishing effort, fishing gears, and distribution of activity. Fisheries issues are also highlighted in the series of ICES ecosystem overviews published in December 2019 (ICES, 2019g – 2019n). Some key messages from the ICES overviews are summarised below.

2.5 The **Arctic Waters** region is included in the ICES overviews for the Barents Sea, Norwegian Sea, and Icelandic Waters. In these ecoregions:

1. landings from the Barents Sea have decreased since a peak in 2011. The largest commercial fish stocks (capelin, cod, and haddock) are now harvested at fishing mortalities close to those in the management plan and have full reproductive capacity. Some of the smaller stocks are overfished. Mobile bottom trawling by the 12 m+ vessel category was deployed over 4,3% of the Barents Sea in 2018 (excluding Russian effort);
2. in the Norwegian Sea, major trends have been expansion and increase in the mackerel stock since 2007 and the decline in the herring stock after 2009. The fishing pressure on the largest commercial fish stocks (herring, blue whiting, and mackerel) has varied since the 1980s. They are now harvested at fishing mortalities close to those in their respective management plans and have full reproductive capacity. The largest demersal fishery targets cod, haddock, and saithe. Mobile bottom trawls used by the 12 m+ vessel category were deployed over approximately 2,2% of the ecoregion in 2018;
3. in Icelandic waters, improved management measures for most of the major stocks (cod, haddock, saithe, redfish, herring) have resulted in decreased fishing mortality, close to or at F_{MSY}. This has furthermore resulted in decrease in effort and less pressure on the benthic habitats. Mobile bottom trawls used by commercial fisheries in the 12 m+ vessel category were deployed over approximately 132 485 km^2 of the ecoregion in 2018, corresponding to ca. 17,5 % of the ecoregion's spatial extent.
4. several fish species depleted by or threatened by fishing in the past are now on the OSPAR list of Threatened and/or Declining species for Arctic Waters, including orange roughy, leafscale gulper shark, porbeagle and spurdog.

2.6 For the **Greater North Sea**, ICES overviews for the ecoregion report that fishing effort has reduced substantially since the 2002 reforms of the European Union's (EU) Common Fisheries Policy. Total landings peaked in the 1970s at 4 million tonnes and have since declined to about 2 million tonnes. The majority of assessed fish stocks are now fished at or below maximum sustainable yield (MSY) fishing mortality targets. The proportional impact of recreational fishing is increasing as commercial operations are restrained.

2.7 Demersal fishing effort (mainly beam and otter trawling) has declined since 2003, while pelagic trawl and seine effort, after a decline, has increased again recently. Beam trawling has been increasingly replaced by pulse beam trawling, sum-wing, twin-rigging, and flyshooting. Nonetheless, mobile bottom trawls in 2018 by the 12 m+ vessel category were deployed over approximately 73,1% of the ICES ecoregion.

2.8 Several fish species depleted by fishing in the past are now on the OSPAR list of Threatened and/or Declining species, including cod, several species of diadromous fish and elasmobranchs (sharks, skates and rays).

2.9 Within the **Celtic Seas**, overall fishing pressure on the commercial fish and shellfish stocks in the ecoregion has decreased since its peak in 1998. Overall fishing mortality for shellfish, demersal, and pelagic fish stocks has reduced since the late 1990s. Of 45 stocks evaluated in the ICES fisheries overview, 30 stocks were being fished at or below MSY.

2.10 The fishing effort of bottom mobile gears in the Celtic Seas ecoregion decreased by 35% from 2003 to 2014. Mobile bottom trawls used by commercial fisheries in the 12 m+ vessel category were deployed over around 44,6% of the ICES ecoregion in 2018.

2.11 Several fish species are on the OSPAR list of Threatened and/or Declining species, including spurdog, common skate, angel shark, porbeagle, and some deep-water sharks. Several remain vulnerable to fisheries, for example as bycatch in demersal trawls and gillnets.

2.12 For the **Bay of Biscay** and the **Iberian Coast**, the ICES overviews report that demersal and pelagic commercial fisheries occur over most of the ICES area. Recreational fisheries in coastal regions are becoming increasingly important. Total landings comprise a mix of pelagic, demersal, benthic, and shellfish species, with pelagic fisheries as the highest proportion. Commercial fishing effort has generally decreased over the last 30 years and fishing mortality is now closer to the level that produces maximum sustainable yield.

2.13 Some species on the OSPAR list of Threatened and Declining species (including sturgeon, eel, gulper shark, skates and rays, spurdog and salmon) have been adversely affected by fishing, for example as bycatch.

2.14 Demersal otter trawls account for the largest proportion of the fishing effort in the region, followed by static gears. Mobile bottom trawls used by the 12 m+ vessel category were deployed over around 19,1% of the ICES ecoregion in 2018. Climate change has had impacts on the distribution and timing of some fishing activities, for

example, the timing of the mackerel fishery (Pinnegar et al, 2020).

2.15 The **Wider Atlantic** is included within the ICES ecosystem overviews for the Oceanic North-East Atlantic ecoregion and Azores ecoregion. In these ecoregions:

1. there are some pelagic and demersal fisheries in the ICES Oceanic North-East Atlantic ecoregion, although catches are relatively small. Bottom trawl fisheries are restricted by spatial management plans set by the North-East Atlantic Fisheries Commission (NEAFC), the fisheries organisation managing most fisheries in the region, and occur only in a few areas.
2. in the Azores ecoregion, there are commercial demersal fisheries in coastal areas, on the slopes and in the deep seas, as well as pelagic fisheries. The state of fish stocks in the ecoregion is generally unknown. Fishing is prohibited below 800 m depth. Bottom trawling has been banned since 2005. Recreational fishing is a relatively important activity.
3. of OSPAR threatened and/or declining species, some molluscs (Patella spp.) and the crustacean Megabalanus azoricus (the Azorean barnacle) have been heavily exploited. Some deep water and pelagic sharks in the ecoregion remain vulnerable to fisheries impacts and some are considered severely depleted or overfished.

Other analyses

2.16 The OSPAR Intermediate Assessment 2017 (IA2017) (/en/ospar-assessments/intermediate-assessment-2017/) assessed the impact of bottom trawling through the OSPAR Common Indicator on the extent of physical damage to predominant and special habitats. (https://odims.ospar.org/maps/1467) It showed that 86% of the assessed areas in the Greater North Sea and the Celtic Seas were physically disturbed, of which 58% were highly disturbed. Consistent fishing pressure occurred in 74% of all assessed areas, and was considered very likely to affect the ability of habitats to recover.

2.17 IA 2017 found that the further decline of sensitive species overall was halted, where assessed in the Greater North Sea and the Celtic Seas, but individual non-target sensitive fish species are caught by routine fisheries operations and these species have not recovered across their whole range. Along with climate change, bycatch has driven a decline in abundance and a spatial contraction in the range of starry ray *Amblyraja radiata*, wolf-fish *Anarhichas lupus* and tusk *Brosme brosme* (Rindorf *et al,* 2020).

2.18 The European Commission has reported that, in the North-East Atlantic, pressure on fish stocks from fishing had eased between 2003 and 2018. The median fishing mortality has now stabilised at around the level of fishing mortality at MSY, and fish biomass has increased, with an increase of 48% since 2003 for fully assessed stocks in the region. Nevertheless, challenges remain with some stocks continuing to be overfished and/or outside safe biological limits (European Commission, 2020a; 2020b).

2.19 Some highly mobile top predator fish species of the oceanic ecosystems are managed by the International Commission for the Conservation of Atlantic Tunas (ICCAT), including the blue-fin tuna (*Thunnus thynnus*) and several shark species such as porbeagle (*Lamna nasus*). ICCAT reports on the state of stocks of tuna and some shark species in the Atlantic. Assessments suggested that stocks of large tunas in the OSPAR area were generally not overfished, but the status of some shark species had been affected by overfishing (ICCAT, 2020). Statistics on bycatch are improving but remain insufficient to provide a scientific basis for providing guidance on fisheries management measures. Blue-fin tuna and porbeagle shark are also included on the OSPAR list.

Map data: © OSPAR Commission | Tiles © Esri — Sources: GEBCO, NOAA, CHS, OSU, UNH, CSUMB, National Geographic, DeLorme, NAVTEQ, and Esri

Figure 5 OSPAR Bottom Fishing Intensity - Surface and Subsurface - 2009 - 2017 https://odims.ospar.org/maps/1467 (https://odims.ospar.org/maps/1467) (https://odims.ospar.org/maps/1467)

Economic status

3.1 The EU's Blue Economy report 2020 reported that profits from European capture fisheries rose in recent years, due to improved fish stocks and fishing opportunities (particularly in the North-East Atlantic), higher market prices, and reduced operating costs, such as fuel (European Commission, 2020c). In 2020, the European Commission noted a positive economic trend for some fleets targeting stocks exploited sustainably (such as anglerfish and megrim in the Irish Sea; sole in the western English Channel and megrim in the North Sea), while fleets targeting overexploited stocks, such as Celtic Sea cod, tended to have poorer economic performance (European Commission, 2020a).

3.2 Detailed analysis is in the annual economic report of the EU fishing fleet (STECF, 2019a). It highlighted that after nine years of continued growth, the net profit achieved by the EU fishing fleet fell slightly in 2017 from the record high of 2016, but was still above 2015. More specifically:

1. in the North Sea and Eastern Arctic, EU fishing effort generally decreased while landings increased, with the value of landings increasing by 25% between 2010 and 2017. In 2017, the largest weights of catch were for sandeel and herring, while the most important in terms of value were Atlantic cod and Atlantic mackerel. The

relative importance of different species varies between years, however; allowable catches of sandeel, for example, can fluctuate considerably;

2. in North Western Waters, fishing effort has generally decreased while landings have increased, with the value of landings increasing by 10% between 2010 and 2017. In 2017, the largest weights of catch were blue whiting and Atlantic mackerel, while the most important in terms of value were Atlantic mackerel, European hake, and great Atlantic scallop;
3. in South Western Waters, fishing effort has generally decreased while landings increased by 5% in volume and 13% in value between 2014 and 2017. In 2017, the largest species landed by weight were small pelagic species, including chub mackerel, sardine, and Atlantic mackerel, while the most important in terms of value were European hake, albacore and European anchovy.

3.3 The tables below give data for capture fisheries in EU countries, divided between the large-scale fleet (LSF) and the small-scale coastal fleet (SSCF)[8] (/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/fisheries/#8). The large-scale fleet covers vessels over 12 metres using static gears and all vessels using towed gears; the small-scale fleet includes vessels under 12 metres using static gears.

Table 1 EU fishing fleets in the OSPAR area in 2017: small-scale coastal fleet (Source STECF 2019a)

	North Western Waters[9]			South Western Waters[10]			North Sea and Eastern Arctic[11]		
	Vessels	**Engaged Crew**	**GVA (thousand Euros)**	**Vessels**	**Engaged Crew**	**GVA (thousand Euros)**	**Vessels**	**Engaged Crew**	**GVA (thousand Euros)**
Belgium									
Denmark							504	152	8 693
France	664	1 261	70 320	708	1 217	52 649	18	52	2 439
Germany							6	6	14
Ireland	634	904	19 027						
Netherlands							179	299	2 321
Portugal				3 004	7412	70 003			
Spain				2 811	6 831	86 270			
Sweden							264	329	5 679
United Kingdom	2 274	3 662	44 973				1 063	1728	29 819

[9]ICES areas V, VI and VII
[10]ICES areas VIII, IX and X, and the COPACE divisions 34.1.1., 34.1.2, 34.2.0
[11]ICES areas I, II, IIIa, IV, and VIId

Table 2 EU fishing fleets in the OSPAR area in 2017: large-scale fleet (Source STECF 2019a)

	North Western Waters			South Western Waters			North Sea and Eastern Arctic		
	Vessels	**Engaged Crew**	**GVA (thousand Euros)**	**Vessels**	**Engaged Crew**	**GVA (thousand Euros)**	**Vessels**	**Engaged Crew**	**GVA (thousand Euros)**
Belgium	26	155	23 903	2	13	2 103	39	189	20 548
Denmark	2	12	25 091				330	902	253 177
France	654	2 819	269 592	659	2 079	162 315	21	246	37 856

	North Western Waters			South Western Waters			North Sea and Eastern Arctic		
	Vessels	Engaged Crew	GVA (thousand Euros)	Vessels	Engaged Crew	GVA (thousand Euros)	Vessels	Engaged Crew	GVA (thousand Euros)
Germany	6	113	12 899				220	644	53 604
Ireland	466	1 768	108 350	9	74	-584	8	58	25 060
Netherlands	11	210	36 089				334	1 615	199 236
Portugal				751	6 629	134 137	2	55	5 217
Spain	60	929	95 748	2 989	12 698	321 574	4	119	35 867
Sweden							162	408	36 536
United Kingdom	867	3 658	241 833	1	6	30	500	2 589	326 900

3.4 The large-scale fleet accounts for most of the weight and value of catches. The European Union's Scientific, Technical and Economic Committee for Fisheries (STECF) reported that for EU fleets in the North Sea and Eastern Arctic region, the large-scale fleet landed 98% of the total weight and 95% of the total value of landings; in North Western Waters, it landed 91% of the total weight and 88% of the value of landings, and in South Western Waters, it landed nearly 89% of the total weight and 79% of the value of landings (STECF, 2019a). Nevertheless, the small-scale fleet can be important as a source of employment (e.g. in remote coastal areas) and as a contributor to the local economy; there can be synergies with local tourism and other marine activities (Stobberup*et al,*2017).

3.5 The capacity of the fishing fleet has decreased in terms of vessel numbers, tonnage and power in the past decade. In the EU, the total fleet tonnage and power at the end of 2019 were below capacity ceilings. Nevertheless, in the North-East Atlantic, STECF assessed in 2017 that many fleet segments are still out of balance with the fishing opportunities available; of 147 segments assessed in 2017, 94 were considered out of balance (European Commission, 2020b).

3.6 Some of these trends have been seen elsewhere in the OSPAR region, but there are some differences. In Norway, the number of vessels declined by 54% between 2000 and 2019 to just under 6 000, and the number of fishers reduced by about 45%. Engine power dropped in the early years of the century, but has recently risen and was at its highest level ever in 2019; gross tonnage also increased over the period. Fish catches overall were roughly stable over the period since 2010. The largest by weight were herring, blue whiting and cod, with the largest by value being cod, herring and mackerel (Norwegian Directorate of Fisheries; 2019a; 2019b).

3.7 In Iceland, the number of vessels in 2019 was 20% lower than in 2000, but little changed since 2010; total tonnage and power of vessels has also fallen since 2000. Fish catches over the period were fairly stable; the value fluctuated over the decade but was higher than in the previous ten years. The largest catches by weight in 2019 were cod, blue whiting, herring and mackerel, with the largest by far in value being cod, followed by haddock, redfish and saithe (Statistics Iceland, 2020a; 2020b).

3.8 Faroe Island landings increased steadily over the period, with the weight of landings in 2018 nearly 68% higher than in 2010 and the value nearly 30% higher, after a decline in value in the early years of the decade (Statistics Faroe Islands, 2019).

Table 3 Fishing fleets in OSPAR countries[12], 2009 and 2019 (data from Eurostat 2020a)

	2009			2019		
	Vessel number	Gross tonnage	Kilowatts	Vessel number	Gross tonnage	Kilowatts
Belgium	89	16 048	51 590	68	12 914	42 808
Denmark	2 822	67 687	244 571	2 802	70 706	208 214

	2009			2019		
	Vessel number	**Gross tonnage**	**Kilowatts**	**Vessel number**	**Gross tonnage**	**Kilowatts**
France	7 269	184 320	1 004 606	6 247	172 656	957 241
Germany	1 769	68 161	161 507	1 310	57 581	128 657
Iceland	1 582	158 253	472 052	1 582	149 086	426 551
Ireland	2 105	68 555	193 391	2 026	65 491	191 395
Netherlands	836	153 700	348 250	822	115 458	299 386
Norway	6 506	369 187	1 252 031	5 980	436 814	1 367 912
Portugal	8 514	103 758	379 135	7 770	87 278	345 489
Spain	11 129	440 244	985 461	8 882	332 454	776 956
Sweden	1 415	38 624	196 423	1 158	23 290	138 271
United Kingdom	6 548	207 796	836 084	5 931	225 158	764 149

[12]Figures in table 3 are for the entire fleet of EU and EEA countries rather than the OSPAR regions

3.9 More detail on fleets, economic status and management arrangements, including quota management, for individual OSPAR countries are available in OECD's reviews of fisheries policy and statistics (OECD, 2017) and in the fleet capacity reports submitted by EU member states (European Commission, 2018).

3.10 Since the last QSR, the landing obligation (so-called discard ban) has been introduced in EU member states. A report by the European Commission's Joint Research Centre (Guillen et al, 2018) pointed to the potential for a landing obligation-induced improvement in size selectivity, to increase maximum sustainable yield, by reducing the capture of juvenile fish and allowing more fish to spawn before capture. This outcome would involve measures associated with the landing obligation such as gear modifications and changes in fishing patterns. However, the report also noted uncertainties around the short- and long-term environmental impacts, as well as economic and social impacts. The European Commission reported in 2020 that assessment of the socio-economic impacts of the landing obligation remains difficult (European Commission, 2020b). However, non-compliance with the landing obligation is thought to have been an issue (European Fisheries Control Agency 2019a; 2019b).

3.11 Discard bans have a longer history in the OSPAR region: a ban on discards in Norwegian cod and haddock fisheries was phased in between 1987 and 2008, and from 2009 was extended to all species. As part of a suite of management measures which have changed exploitation patterns (e.g. increasing the average age of fish landed), in combination with favourable environmental conditions, it is thought to have contributed to long-term increases in stock yields and to economic profitability (Gullestad *et al,*2015). Discard bans have also been in place in Faroese and Icelandic fisheries. NEAFC introduced a discard ban in its regulatory area in 2010.

Future trends

4.1 The FAO's 2020 report on the state of world fisheries and aquaculture projected that capture fisheries production in the EU and Norway would remain roughly unchanged between 2018 and 2030. Globally, it anticipated seafood prices remaining high over the period, despite some decline in real (rather than nominal) prices. This scenario is not a forecast, however, and could be affected by many factors such as macroeconomic conditions, trade rules, environmental conditions, fisheries management measures and market shocks (FAO, 2020a).

4.2 The EU Blue Economy report 2020 anticipates continued improvement of economic performance in the longer term. It notes that the landing obligation should lead to more abundant fish stocks with larger fish sizes in the long term, resulting in increased revenue and reduced operational costs (European Commission, 2020c). Modelling undertaken by projects funded under the Horizon 2020 programme (DiscardLess and Minouw) had suggested that there would be short-term negative economic impacts, but more positive impacts in the longer term. There may also be strategies, such as quota swapping, to mitigate negative economic effects (European Commission, 2020b). STECF analysis noted that in the North Sea and in North Western Waters, the pelagic fisheries are not expected to be affected greatly, but there would be more challenges expected for demersal mixed fisheries, including the impact of potential choke species; in South Western Waters, some pelagic species could become choke species (STECF, 2019a). The Commission has also emphasised the need for more efforts to increase selectivity in fishing gear and techniques, and to address control and enforcement of the landing obligation, through tools such as remote electronic monitoring systems (European Commission, 2020a).

4.3 The future economic performance will in practice be affected by many variables – among issues mentioned in the annual economic report on the EU fleet are factors such as aging vessels in some areas, the difficulty of attracting new entrants to the sector, competition with recreational fisheries or restrictions due to energy production or conservation objectives. There may also be regional factors: for example, in the North Sea, STECF notes that catch thresholds (TACs) may decrease for important species; at the same time, some large scale fleets (Denmark, the Netherlands and Germany) are investing in new vessels and fishing techniques (STECF 2019a). There may also be new opportunities – for example, in 2019 the Norwegian Government permitted the start of a new fishery, the commercial harvesting of the copepod *Calanus finmarchicus* (Norwegian Ministries, 2019). Norway's bioeconomy strategy stated that the annual production of *Calanus* species in the Norwegian Sea is almost double the global production of fisheries and aquaculture, while also noting that a better understanding of the potential for and consequences of harvesting at lower trophic levels was still needed (*Norwegian Ministries, 2018*). Wild seaweed harvesting might also expand into new areas (e.g. Marine Scotland, 2016; Irish Government, 2018).

4.4 The eventual impact of the United Kingdom leaving the Common Fisheries Policy on fish populations and the ecosystem remains uncertain. However, the trade and cooperation agreement between the EU and United Kingdom includes a shared objective of "exploiting shared stocks at rates intended to maintain and progressively restore populations of harvested species above biomass levels that can produce the maximum sustainable yield", as well as having regard to principles such as minimising the harmful impacts of fishing on the marine ecosystem. The agreement provides for annual consultations to agree total allowable catches (TACs). If TACs cannot be agreed, provisional TACs are to be set corresponding to the level advised by ICES.

4.5 Climate change is a significant uncertainty. Stock distributions and/or sizes may change, potentially affecting assessment of sustainable catch levels and complicating negotiations between coastal states. For example, the EU-funded Climefish programme has looked at scenarios for several areas within the OSPAR region:

1. for the North-East Atlantic as a whole, changes in stock biomass and feeding distribution are expected to increase complexity in allocations of shared stocks of whiting, mackerel and herring, with the risk of overfishing due to unilaterally set quotas. There is also a projected large increase in the zooplankton *Calanus finmarchius*, which could result in opportunities of increased fishery, but also risks to the food chain such as bycatch of fish larvae (Climefish, 2019a)[13 (/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/fisheries/#13)];
2. the production potential of the Barents Sea is expected to increase to 2050, along with northward shifts of species such as cod and haddock. This has a potentially negative risk for the associated ecosystem, and may have both opportunities and risks for commercial fisheries (Climefish, 2019b);
3. for seas west of Scotland, simulations suggest that warming will negatively affect the abundance of cold-water species such as cod, but might be beneficial to species such as whiting and hake (Climefish, 2019c).

4.6 Further analysis can be found elsewhere; for example work by ICES looked at scenarios for twenty species and identified areas likely to have the biggest implications for future management (North Sea, southern areas, West of Scotland, North of Scotland, Norwegian Sea and Skagerrak-Kattegat) and several species with potential to become choke species (anchovy, anglerfish, blue whiting, cod, hake, herring, mackerel, megrims, and plaice) (ICES, 2017a). A report by the United Kingdom's Marine Climate Change Impacts Partnership highlighted changes that have already occurred, such as the decline in primary productivity in the North Sea over the past 25 years, shifts in mackerel distribution causing issues for quota allocation, and increasing sightings of tuna off the British Isles (Pinnegar et al, 2020). An Intergovernmental Panel on Climate Change (IPCC) report on oceans refers to changes in fish populations already evident in Arctic regions and the uncertainties around the impact of climate change for fishing opportunities in the region (IPCC, 2019). FAO reported projected large-scale redistribution of maximum fisheries catch potential in the North Atlantic by 2055, including a 30-70% increase in in high latitude areas such as the exclusive economic zones of Norway and Greenland, and decreases below 50°N (FAO, 2018).

4.7 The major expansion of offshore wind developments projected in European waters in the coming decades may have implications for fisheries; more analysis of the potential interactions is needed (European Commission, 2020d).

Quality Status Report 2010 and Intermediate Assessment 2017

5.1 QSR 2010 highlighted the continued impact of fishing pressure on the ecosystem, with many stocks still fished beyond sustainable levels, and concerns about habitat destruction (notably through damage to the seabed through fishing gear) and changes in community structure and foodwebs (e.g. through depletion of key predator and prey species). It noted that measures such as long-term management plans, quota-based systems, closed areas and abolition of financial subsidies had been put in place. It called for cooperation to achieve reductions in fishing pressure, to address discarding, to take account of the special vulnerability of deep water species and habitats, and to keep bycatch of marine mammals, sharks, seabirds and turtles to a minimum, and preferably eliminated.

5.2 Assessments for the IA 2017 showed that management measures were beginning to have a positive impact on fish communities, with deterioration having been halted and fish communities showing signs of recovery in some areas. The IA 2017 considered that recovery may continue in most areas provided that fisheries pressures do not increase again. Physical disturbance from bottom trawling remained significant: 86% of the assessed areas in the Greater North Sea and the Celtic Seas were physically disturbed, of which 58% was highly disturbed; and consistent fishing pressure occurred in 74% of all assessed areas, which was very likely to affect the ability of habitats to recover. Across the assessment period (2010-2015), the amount of pressure in specific assessment cells was not always consistent, particularly in the Greater North Sea. Overall, there were no clear trends across habitats or regions.

Analysis of specific pressures, impacts and measures

6.1 A detailed description of the wide range of measures used to manage exploitation of fish stocks in the OSPAR region is beyond the scope of this report. Nor does OSPAR itself have competency to adopt programmes or measures concerning questions of fisheries management (see Annex V of the OSPAR Convention). This section therefore briefly summarises the general background to the management of fish stocks, before covering measures put in place to address other environmental impacts of fisheries, such as litter, bycatch, and damage to habitats.

Sustainable exploitation of fish populations

What is the issue

6.2 As QSR 2010 reported, exploitation of fish stocks beyond sustainable levels has been a problem in the OSPAR region. As well as the loss of fisheries yield, overfishing can lead to stock depletion, changes in fish communities and marine food webs at various trophic levels, reduction of biological diversity, loss of capacity of fish stocks to adapt to environmental changes, and even fisheries collapse. Returning stocks to favourable level is therefore a key aim of fisheries and environmental policy: for example, the EU's Marine Strategy Framework Directive's approach to achieving good environmental status includes populations of all commercially exploited fish and shellfish to be within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock. Stocks should be exploited sustainably consistent with high long-term yields; have full reproductive capacity in order to maintain stock biomass; and the proportion of older and larger fish/shellfish should be maintained or increased. This is informed by the concept of Maximum Sustainable Yield (MSY), which is the maximum annual catch which can be taken year after year without reducing the productivity of the fish stock (European Commission, 2019).

6.3 The assessment of MSY is informed by advice from ICES: evaluating MSY does require good information on the stocks; where that is not possible ICES advice is based on precautionary considerations. The fishing mortality associated with MSY is known as FMSY. FMSY is not the only influence on stocks, which are subject to natural variability that can exceed the influence of fishing. Furthermore, the dynamic nature of marine ecosystems means that MSY itself can change: ICES considers MSY reference points to be valid only in the medium-term and to be subject to regular reviews (ICES, 2019o). Furthermore, fish populations are not independent units: they interact through competition for food and habitat, or as predator and prey, and fisheries activity will influence a range of

species. ICES has developed mixed fisheries advice for areas such as the North Sea, Celtic Seas, and Iberian waters (ICES, 2017b). ICES also provides advice on vulnerable marine environments which would be damaged by fishing activities, notably bottom fishing (e.g. ICES, 2020a).

6.4 Even at MSY levels, fishing will have impacts on the ecosystem and its food webs. Analysis of the environmental status of food webs is complex, however: the European Commission has noted that assessment of the state of food webs across European seas is affected by a lack of consistent approaches, high uncertainty, or lack of data (European Commission, 2020e). Changes in fisheries regulation can affect ecosystems: for example, the potential impacts of a discard ban on populations of seabirds include changes in food supply for scavenger species as well as reduced bycatch if birds are less attracted to fishing gear (e.g.*Bicknell et al,*2013;*Clark et al,*2020).

Measures and impacts of measures

6.5 Fisheries in the OSPAR region are regulated through a combination of arrangements, including national measures, bilateral and multilateral agreements, the EU Common Fisheries Policy, and measures adopted by three regional fisheries management organisations: the North-East Atlantic Fisheries Commission (NEAFC), the International Commission for the Conservation of Atlantic Tunas (ICCAT), and the North Atlantic Salmon Conservation Organization (NASCO). OSPAR has memoranda of understanding with NEAFC and NASCO; ICCAT is an observer to OSPAR.

6.6 Norwegian, Icelandic and Faroese fisheries (and, from now on, the United Kingdom) are managed through frameworks set by the national governments. For example, in Norway, the Marine Resources Act 2009 integrates conservation and sustainable use as principles of fisheries management (more information on the approach can be found in Gullestad*et al,*2017). For the EU, the Common Fisheries Policy has the objective of restoring and maintaining stocks to levels that can produce MSY. The mechanisms used include controls on Total Allowable Catches (TACs), effort controls, access restrictions and the landing obligation. Multi-annual plans are used to promote some stability for the industry. The European Commission's 2020 review of the status of the marine environment and its 2020 review of sustainable fishing in the EU report that, in the North-East Atlantic, the average fishing mortality is below or very close to the average mortality consistent with MSY (FMSY). Since 2010, an increasing proportion of EU TACs have been set in line with MSY advice, climbing from 6% in 2005 to 71% in 2018 and 79% in 2020 of the FMSY-assessed TACS fished in the North-East Atlantic, North Sea and Baltic Sea. Nonetheless, the Commission concluded that further management is still required if TACs are to be brought fully in line with scientific advice (European Commission, 2020b; 2020e).

6.7 Management of deep sea fisheries can require particular care given the special nature of these environments, including low productivity. Damaged environments are unlikely to recover. Deep sea fish stocks are highly vulnerable to over-fishing, and catches have been declining for years. In the oceanic region of the North-East Atlantic, multispecies fisheries for deep-sea species peaked at 30 000 tonnes in 1975, but now amount to less than 4 000 tonnes annually (*ICES, 2019n*). NEAFC also reported a fall in catches in its regulatory area in the period from 1973 to 2016. While effort in later years was distributed widely geographically, deep-sea fisheries in the Barents Sea and Norwegian Sea were very minor compared with the Atlantic Ocean south of the Greenland-Scotland ridges, and even the latter were comparatively small, involving a few trawlers and longliners (NEAFC, 2018a).

6.8 For EU deep-sea waters, a new regulation (EU 2016/2336) was agreed in 2016, establishing conditions for deep-sea stocks. This restricts deep-sea fishing to areas already fished in the past, bans on trawling below a depth of 800 m, and closure of bottom fishing below 400 m in areas with vulnerable marine environments (European Commission, 2016). In the NEAFC area, NEAFC's 2018 recommendation on deep-sea fisheries within its regulatory area is based on a precautionary approach and provides for fisheries to only expand gradually and on the basis of data facilitating assessment of sustainability (NEAFC, 2018b). NEAFC has since 2012 also made recommendations which prohibit fishing for deep-sea sharks, selected skates and rays, and chimaeras (rabbit fish). A 2019 review for NEAFC concluded that implementation of its regulation on vulnerable marine environments had been largely effective; further action to improve monitoring and management advice has been agreed by NEAFC (NEAFC, 2020a). Continuing work by ICES / NAFO's (Northwest Atlantic Fisheries Organization) joint group on deep-water ecology is improving understanding of vulnerable ecosystems and management tools to protect them (ICES, 2020b).

Bycatch and other impacts on species and habitats

What is the issue

6.9 The IA 2017 reported that, in 2013, up to 2 000 harbour porpoise died as a result of entanglement in commercial nets in the North Sea assessment unit, out of a total population of 345 400; an estimated 1 500 individuals died in the Irish and Celtic Seas, out of a population of 107 300; and, in 2014, 260 harbour porpoise were estimated to have died in the Kattegat and Belt Seas, out of a population of 42 300.

6.10 The 2019 series of ICES ecosystem assessments concluded that, in many areas, fisheries activities continue to have an impact through bycatch on marine mammals, seabirds and vulnerable species of fish (ICES, 2019a-n). In some cases, the bycatch was at levels which threaten the viability of populations. Several species affected are on the OSPAR list of threatened and/or declining species, including skates, rays, and sharks. For cetaceans, examples of population impacts identified by ICES included potential extinction of the local population of harbour porpoise off Iberia; bycatch mortality of common dolphins or porpoises possibly exceeding ASCOBANS[14] (/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/fisheries/#14) limits in the Bay of Biscay and Iberian Coast ecoregion, the Celtic Seas, the western English Channel and the Greater North Sea; and bycatch also in Icelandic Waters, the Barents Sea and the Norwegian Sea. ASCOBANS highlights that, in all part of its agreement area, the annual bycatch rate for harbour porpoise is significantly above the ASCOBANS 1,7% limit for total anthropogenic removal. ICES also reports that bycatch of seals in recent years in Icelandic waters is estimated as 9–19% of local populations for harbour seal, and 8–24% for grey seal; in the Norwegian Sea, grey seal pup production fell by 50-60% between 2007 and 2015 in mid-Norway, probably as a result of increased bycatch. Seabird bycatch also occurs in many areas and may be the reason for the loss of some species such as the Iberian form of the common guillemot. However, ICES/OSPAR/HELCOM work has reported that information on the scale and impact of seabird bycatch needs to be improved (ICES, 2018).

6.11 Damage to vulnerable habitats from the impact of fishing gear, and the need to protect them, is already recognised in fisheries and habitat protection measures. Evaluation of the benthic impact from fisheries at a wider regional scale is more complex. An ICES working group is developing a framework to assess this, and to apply it to specific regions (ICES, 2020c). In NEAFC waters (high seas) ICES has been assessing and advising on Vulnerable Marine Ecosystems since the early 2000s.

6.12 In the past decade, licences for the use of electricity to catch target species – pulse trawling – have been issued in EU waters, the majority to vessels from the Netherlands. Over 80 Dutch vessels held licences for pulse trawling in the North Sea in 2019. There are arguments that pulse trawling can improve catch selectivity and reduce the damage to sea floor habitats from conventional trawling; however, concerns have also been raised about impacts on other species, fish welfare, and socio-economic consequences for other fisheries. The new EU technical measures regulation 2019/1241 now prohibits electric pulse trawling in all EU waters from July 2021, and pulse trawling is also now prohibited in United Kingdom waters. Work to understand the impacts of pulse trawling continues: a report from the ICES working group on electric trawling concluded that a transition from conventional beam trawling to pulse trawling for North Sea sole would improve the ecological performance of the fishery; the criteria used were restricted to the ecological and environmental domain and the comparison of pulse trawling with conventional beam trawling (ICES, 2020d).

Measures

6.13 Measures to address bycatch and habitat damage are cited in several OSPAR Recommendations to further the protection and conservation of species and habitats, including sessile organisms such as deep sea sponges or cold water corals, elasmobranchs, seabirds and cetaceans. Actions recommended include designation of protected areas, encouragement for national authorities to adopt and implement fisheries management measures, designation of protected areas, and information campaigns.

Table 4: Examples of OSPAR Recommendations for the protection and conservation of species and habitats that include measures to be implemented that are relevant to bycatch or habitat damage

Recommendation 2016/03 on furthering the protection and conservation of the Atlantic salmon (Salmo salar) in Regions I, II, III and IV of the OSPAR maritime area
Recommendation 2015/04 on furthering the protection and conservation of the Allis shad (Alosa alosa) in Regions II, III and IV of the OSPAR maritime area
Recommendation 2015/03 on furthering the protection and conservation of the sea lamprey (Petromyzon marinus) in Regions I, II, III and IV of the OSPAR maritime area
Recommendation 2014/16 on furthering the protection and conservation of the Iberian guillemot (Uria aalge) in Region IV of the OSPAR maritime area
Recommendation 2014/08 on furthering the protection and conservation of the thornback ray (Raja clavata) in the OSPAR maritime area
Recommendation 2014/05 on furthering the protection and conservation of the Portuguese dogfish (Centroscymnus coelolepis) in the OSPAR maritime area

Recommendation 2014/11 on furthering the protection and conservation of hydrothermal vents/fields occurring on oceanic ridges in Region V of the OSPAR maritime area
Recommendation 2014/06 on furthering the protection and conservation of the porbeagle shark (Lamna nasus) in the OSPAR maritime area
Recommendation 2014/04 on furthering the protection and conservation of the leafscale gulper shark (Centrophorus squamosus) in the OSPAR maritime area
Recommendation 2014/03 on furthering the protection and conservation of the gulper shark (Centrophorus granulosus) in Regions IV and V of the OSPAR maritime area
Recommendation 2014/01 on furthering the protection and conservation of the common or European sturgeon (Acipenser sturio) in Regions II and IV of the OSPAR maritime area
Recommendation 2013/12 on furthering the protection and conservation of the Steller's eider (Polysticta stelleri) in Region I of the OSPAR maritime area
Recommendation 2013/11 on furthering the protection and restoration of the harbour porpoise (Phocoena phocoena) in Regions II and III of the OSPAR maritime area
Recommendation 2013/07 on furthering the protection and conservation of the loggerhead turtle (Caretta caretta) in Regions IV and V of the OSPAR maritime area
Recommendation 2013/06 on furthering the protection and conservation of the leatherback turtle (Dermochelys coriacea) in the OSPAR maritime area
Recommendation 2013/03 on furthering the protection and recovery of Modiolus modiolus beds in the OSPAR maritime area
Recommendation 2013/02 on furthering the protection and conservation of Sabellaria spinulosa reefs in Regions II and III of the OSPAR maritime area

6.14 In the EU, Regulation 812/2004 set out measures to limit bycatch of cetaceans in fisheries, including the use of acoustic deterrents ('pingers') and reporting requirements. The 2012 EU action plan on reducing seabird bycatch describes recommended measures for addressing bycatch associated with various types of fishing (European Commission, 2012). In 2019, a new regulation 2019/1241 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures was adopted (including repeal of 812/2004). It addresses objectives including the landing obligation, minimising catches of juveniles and vulnerable fish species, and reduction of ecosystem impacts (including bycatch) through approaches including closed areas, prohibiting catches of certain fish species, and measures regulating fishing gear.

6.15 Within the OSPAR region, ASCOBANS has species action plans for harbour porpoise in the North Sea (2009) and for common dolphin in the North-East Atlantic (2019), which include actions relating to bycatch. Individual countries also have action plans (e.g. the Netherlands). ACCOBAMS[15] (/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/fisheries/#15) also has an action plan on common dolphin which reaches into parts of the Bay of Biscay and Iberian Coast.

Impact of measures

6.16 Some improvements in addressing bycatch have occurred: for example, according to ICES, some bycatch in Celtic Seas fisheries may have reduced in recent years due to less fishing activity and the use of acoustic alarms attached to fishing gear as a mitigation technique (ICES, 2019j). In the North Sea, where there was some evidence of large bycatches of seabirds in coastal gillnets in the past, fisheries with high bycatch have either been closed or reduced bycatch risk (ICES, 2019d).

6.17 Nevertheless, in view of the problems that remain, international bodies have highlighted the need for more to be done. For example, to improve data availability, ICES has advised that better monitoring of bycatch is needed, including for smaller vessels. It also said that it is difficult to assess compliance with EU pinger requirements, and that, in general, there has been little progress in mitigating cetacean bycatch (ICES, 2019p). A review by STECF of the EU regulation on cetacean bycatch made recommendations for improvement, including better enforcement, monitoring, regional plans on pinger use, and more flexibility to use a wider range of measures to mitigate bycatch of

cetaceans (STECF, 2019b). There may also be need for specific local measures – for example, ICES has recently advised measures for the protection of the common dolphin in the Bay of Biscay, through a combination of temporal closures and application of pingers on pair trawlers to mitigate bycatch (ICES, 2020e).

Litter from fishing operations

What is the issue

6.18 The IA 2017 identified fishing litter as one of the main sources of litter in the OSPAR area. Fishing litter can include trawl nets, gill nets, traps, cages and pots, and ropes. For example, nets and ropes made up between 16% (Bay of Biscay/ Iberian Coast) and 30% (Northern North Sea) of all items recorded in OSPAR beach litter surveys in 2014/15; fishing litter is also found on the seafloor. Litter can be ingested by marine animals, entangle them (including 'ghost fishing' by lost or discarded nets), disrupt benthic habitats, or act as a vector for invasive species. There can potentially also be costs to the fishing industry itself, such as through damage to gear and reduced fishing populations due to ghost fishing.

Measures

6.19 Action on fisheries litter is a key part of OSPAR's 2014 Regional Action Plan for marine litter. The actions cover:

1. identification of options to address key waste items, including deposit schemes, voluntary agreements and extended producer responsibility;
2. work with the fishing industry and competent authorities to develop and promote best practice;
3. reduction of waste due to dolly rope (plastic threads used to protect trawl nets against wear);
4. a stronger OSPAR Recommendation on fishing for litter initiatives and a Recommendation on education for fishers;
5. risk assessment of areas of accumulation of ghost nets, and of other hotspot areas.

6.20 A survey of marine litter management practices for the fishing industry in OSPAR countries was carried out in 2017 (Mengo, 2017). In addition, further development of recommendations under the action plan areas has continued. For example, an OSPAR study on key waste items from the fishing industry included recommendations on better data; communication; creation of economic incentives, such as extended producer responsibility; voluntary initiatives within the sector; pilot projects; and awareness raising (OSPAR, 2019a). Work on the design and recycling of fishing gear identified possible future steps for OSPAR, individual Contracting Parties, or the EU (OSPAR, 2020). OSPAR has also issued a Recommendation and guidelines on the reduction of marine litter through sustainability education programmes for fishers (OSPAR, 2019b; 2019c). The EU Clean Atlantic project also provides a mechanism for follow through of some of the OSPAR action plan commitments.

6.21 Mechanisms which promote return of waste items to shore have been, or are being, put in place. In the OSPAR area. In Iceland, there is a voluntary agreement where fishermen can deliver nets and dolly ropes to waste receptions facilities free of charge; there is also a scheme in Norway. The EU's 2019 Directive on the reduction of the impact of certain plastic items on the environment (Directive 2019/904) covers fishing gear. It states that member states should introduce extended producer responsibility for fishing gear and components of fishing gear containing plastic to ensure separate collection of waste fishing gear and to finance environmentally sound waste management of waste fishing gear, in particular recycling. Another 2019 Directive, the Port Reception Facilities Directive (Directive 2019/883), addresses litter from shipping, including fishing, including through incentives for delivery of waste to ports, and better monitoring and enforcement.

6.22 Prevention of litter can be supplemented by 'fishing for litter' schemes, where fishers collect litter caught in their nets and dispose of this safely on returning to port. These schemes deal with all sources of litter, rather than solely litter from fishing activities, but can contribute to raising awareness within the fishing industry and to changing practices and culture. OSPAR has produced a Recommendation (OSPAR, 2016) and guidelines (OSPAR, 2017) on fishing for litter, and has also adopted a target of increasing the total number of vessels participating in fishing for litter schemes in the OSPAR Maritime Area by 100% by 2021, compared to the baseline situation in 2017.

Impact of measures

6.23 In the OSPAR Beach Litter Assessment 2021, "maritime related items" which includes fishing and aquaculture related litter as well as strings and cords (which can come from different sources but are often mainly related to fishing), has a median value of 27 litter items / 100 m across all OSPAR beaches in the OSPAR Maritime Area. Of the 15 top beach litter types, four belong to the maritime related group. The regional distribution is fairly homogeneous (between 20 and 40 litter items / 100 m), excluding the Wider Atlantic which records very low quantities of maritime related items (1 item / 100 m). Decreasing trends are observed in several areas but overall reductions appear limited in most regions. However, as this part of litter is directly targeted by OSPAR measures it is expected to decrease in coming years.

IUU fishing

6.24 Illegal, unregulated or unreported fishing activity (IUU), contravening fisheries agreements and management regimes is, at a global level, a significant threat to fish stocks and the wider ocean ecosystem. Globally, the OSPAR member countries (whether individually or as the EU) are parties to the FAO's Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, which came into force in 2016. This sets out measures which parties apply when foreign vessels seek entry into their ports, thus blocking entry into markets of fish captured by IUU fishing (more information at FAO, 2020c).

6.25 Within the OSPAR area, controls on IUU fishing include:

1. in the NEAFC area, non-Contracting Party fishing vessels appearing to engage in IUU activities are placed on lists of concern. Investigations are made into vessels on NEAFC's 'A list'; if there are no extenuating circumstances, the vessel is placed on the 'B list'. Vessels on the B list face severe restrictions on their activity in the NEAFC area, and potentially beyond it (NEAFC, 2020b);
2. in the EU, regulation 1005/2008, establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing, came into force in 2010, so that only fisheries products certified as legal can be imported into or exported from the European Union;
3. in the Arctic, a new agreement to prevent unregulated high seas fisheries in the central Arctic ocean was signed in 2018 by Arctic coastal states (Norway, Canada, Denmark, Russia and the United States), the EU, Iceland, China, Japan and South Korea. The parties will not allow their own vessels to fish in the international part of the central Arctic Ocean until international conservation and management measures have been established; this applies for an initial period of 16 years once the agreement comes into force and can be extended. Part of this area is already covered by NEAFC management measures (see NEAFC, 2018c).

Sustainability indices

6.26 Certification of fisheries is a means to recognise the sustainability credentials of a fishery and to communicate that designation through the supply chain, including to consumers. The most widespread scheme is that operated by the Marine Stewardship Council (MSC). This takes account of the sustainability of fish stocks, environmental impacts, and effective fisheries management. For example, a fishery cannot be certified if it causes significant or long-term damage to seafloor habitats or other vulnerable marine ecosystems.

6.27 Fisheries are assessed by independent certifiers, and fish which meets MSC standards can be sold using the MSC blue label. According to MSC's annual report for 2018-19, the proportion of the total fishing catch in the North-East Atlantic that is MSC certified is in the range 40-60% (Marine Stewardship Council, 2020). Fisheries added to the MSC certification list and mentioned in recent reports include the Faroe Islands ling and tusk fishery, and the Russian red king crab fishery in the Barents Sea (Marine Stewardship Council, 2019a). Recently, in July 2020, the Norwegian blue whiting fishery, of 438 000 tonnes in 2018, was newly certified. Fisheries can also have their MSC certification suspended: for example, in 2019 this occurred with French and Spanish sardine fisheries in the Bay of Biscay, as it was feared that levels of fishing effort were above those needed to achieve MSY, with North-East Atlantic mackerel fisheries; and with North Sea cod, where the impact of warming waters may be one reason for the decline in the stocks (e.g. Marine Stewardship Council, 2019b; 2019c).

Conclusions

7.1 Key messages 16 (/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/fisheries/#16)

1. While stocks in the OSPAR Maritime Area are increasingly being fished consistently according to the reference level MSY, OSPAR could consider how to improve its understanding of how fishing at these levels influences other components of the ecosystem, and ecosystem health overall;
2. There is a need to understand future trends, including impacts of climate change on fish stocks and the ecosystem, any instabilities caused by tensions over fisheries management, or other activities potentially impacting on fisheries (e.g. expansion of renewable energy). This would include whether new fisheries (e.g. for copepods) do have potential for significant environmental impacts;
3. OSPAR should continue to identify which fishing activities need particular focus from fisheries management authorities as they pose a threat to biodiversity and ecosystems, and where, and which other human activities are affecting the fishing resource. This could include assessment of impacts in different regions, including where pressures on sea floor integrity might have the most significant negative impact on ecosystems;
4. OSPAR is considering an operational objective on bycatch as part of its updated North-East Atlantic Strategy. This should give increased attention to the effects of incidental bycatch of marine mammals, birds and

protected fish species; OSPAR should take into consideration relevant bycatch studies (in the framework of OSPAR, European Commission, ICES, ACCOBAMS, ASCOBANS) and their conclusions to come;

5. OSPAR could consider working more closely with relevant management, certification and accreditation organisations to ensure awareness of OSPAR status assessments and other assessments.

Distribution and intensity of activity

7.2 Fisheries are distributed across all OSPAR regions, with substantial fisheries in many parts of the OSPAR Maritime Area. (Paragraphs 2.5 - 2.15)

Trends

7.3 The majority of stocks, but not all, are now being fished at or approaching levels consistent with maximum sustainable yield. In most regions this has involved substantial reductions in fishing pressure from previous peaks. Trends since 2010 have varied according to the specific conditions of ICES ecoregions. Future trends will be dependent on factors such as fisheries management arrangements and the effects of climate change. (Paragraphs 2.5 – 2.15; 4.1 - 4.6)

Economic value

7.4 The large-scale fishing fleet dominates the economic of landings, although the small-scale fleet can have local economic importance. Fishing fleet capacity has dropped across OSPAR contracting parties, other than Norway, in the last decade. However, net profits have generally risen in recent years. (Paragraphs 3.1 – 3.9)

Pressures and impacts

7.5 The main pressures and impacts resulting from fisheries are harvesting of fish stocks, leading to impacts on biodiversity, fish stocks and food webs; impacts on vulnerable species (including fish, birds and marine mammals) from bycatch; damage to vulnerable habitats or to sea floor integrity arising from activities such as bottom trawling; and the impacts of litter from fishing activities. (Paragraphs 6.1 - 6.24)

Measures

7.6 Fisheries management regulations have resulted in the harvesting of more fish stocks moving to levels considered sustainable (from a fish stock management perspective), but gaps remain. Measures to protect vulnerable habitats and species have been introduced, but concerns remain (e.g. cetacean bycatch). Measures to reduce littering from fishing are being put in place across the OSPAR Maritime Area. (Paragraphs 6.1 – 6.27)

Summary table

7.7 (Assessment is of total capture production.)

Table 5

	OSPAR REGIONS				
	I	**II**	**III**	**IV**	**V**
Relative intensity	H	H	H	M	L
Trend since 2010	↓	↑	↑	↔	↔
Forecast trend to 2030	?	?	?	?	?

Footnotes

[1]Total of 9,32 million tonnes includes FAO categories of marine fishes, diadromous fishes, freshwater fishes caught in marine areas, crustaceans, molluscs, miscellaneous aquatic animal products, miscellaneous aquatic animals. Does not include aquatic plants or aquatic mammals. Includes capture from recreational fisheries if provided. Data is for FAO Area 27; includes Baltic and some far north areas not in OSPAR convention area. Detailed breakdown in FAO (2020b).

[3]Fisheries management in the Barents Sea is conducted in accordance with the fisheries policies of Russia and Norway; catch opportunities are agreed by the Joint Norwegian–Russian Fisheries Commission.

[4] F_{MSY} is estimated as the fishing mortality with a given fishing pattern and current environmental conditions that gives the long-term maximum yield (ICES, 2019o).

[5] Further information on the reduction of otter trawl fishing effort, and links to increases in the Large Fish Index for demersal fish in the North Sea, is in Engelhard *et al*(2015) and Couce *et al* (2019).

[6] Inshore effort by smaller vessels is under-represented in these analyses (Cefas, pers.comm)

[7] Within the North Sea, Couce *et al*.2019 demonstrated that the change in beam activity has led to more concentrated fishing effort nearer to the coastal areas in the south-east

[8] STECF (2019a) states that not all data were provided for German pelagic trawlers in the North Sea / eastern Arctic; this segment is not included in the analysis

[13] Some other work suggests that primary production and copepod biomass declines consistent with climate change are likely to lead to declines in fisheries yield (e.g. Lotze *et al,* 2019)

[14] Agreement on the Conservation of Small Cetaceans of the Baltic, North-East Atlantic, Irish and North Seas

[15] The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area

[16] The views expressed on key messages are those of the assessor and do not necessarily represent the views of the OSPAR Commission

References

⊞ Expand to view references