Fisheries management in the Baltic Sea

How to get on track to a sustainable future in Baltic fisheries

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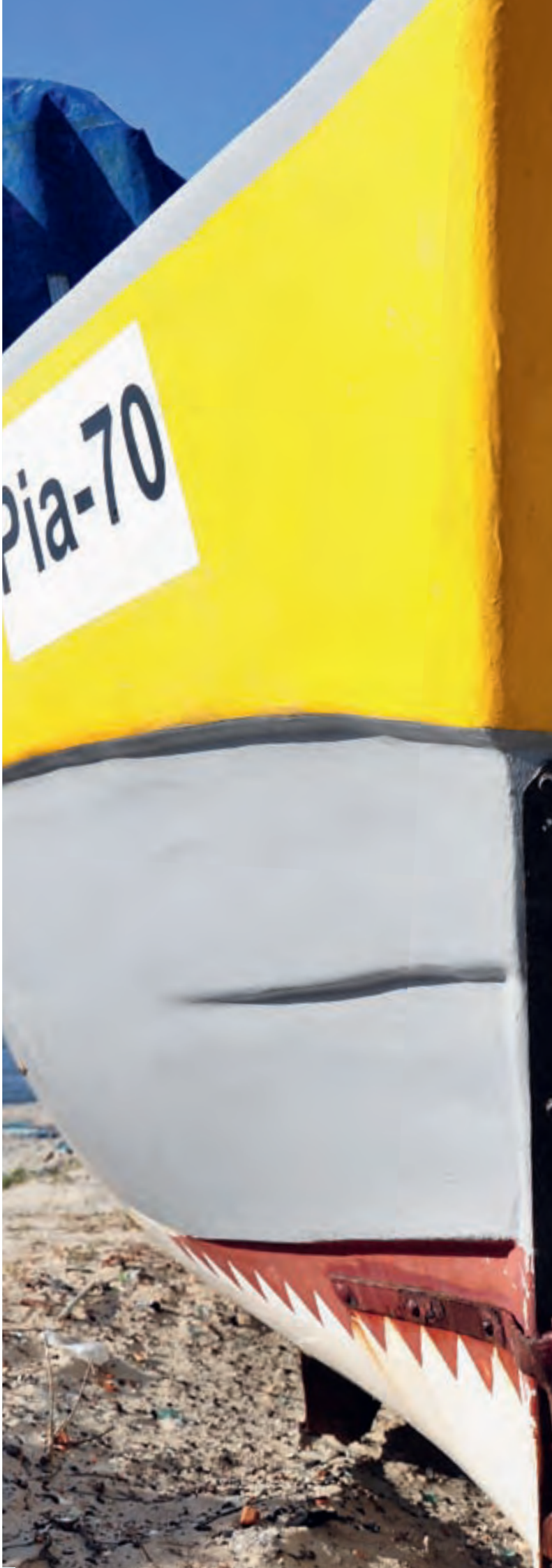
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Artisanal fishing vessels at the beach of Sopot, Poland.
April 2011. © OCEANA/ LX

A multitude of human activities have put the Baltic Sea ecosystems under severe pressure and turned this brackish, semi-enclosed sea into one of the most polluted in the world. Destructive fishing practices like dredging and bottom trawling pose heavy threats to these sensitive ecosystems. Oceana's report on fisheries outlines the biggest problems related to fisheries in the Baltic Sea and shows that the problem of Illegal, Unregulated and Unreported (IUU) fishing remains a problem. The report also provides an overview of issues on the political agenda in European Union and discusses the need for improved fisheries management and the implementation of agreed commitments, like achieving Maximum Sustainable Yields (MSY) for all fish stocks by 2015 as a first step towards a sustainable fisheries management, and legal obligations, like achieving Good Environmental Status of all marine environments, including Baltic Sea by 2020.

Over 50 species of fish are commercially caught in the Baltic Sea and the Kattegat, for which only 10 of have been given scientific advice, and only five are managed with Total Allowable Catch (TAC) in the Baltic Sea. While the status of the eastern Baltic cod stock has improved over the last years, other stocks have not been as successful: most of the Baltic fish stocks are overfished, and for five of these (sea trout, flounder, turbot, brill and dab) scientific advice to limit fisheries has been ignored. Additionally, in the case of salmon in particular, the TAC was set twice as high as the scientific advice recommended. Despite the fact that salmon, sea trout and eel are all threatened and declining, they remain continuously commercially fished.

IUU fishing for cod in the Eastern Baltic Sea has declined in the past years after increased monitoring, control and surveillance efforts, but the problem is not solved overall and the percentage of unreported catches is still very high in certain fisheries. The worst examples right now include Baltic salmon and sea trout and cod in the Kattegat.

During the 2011 at-sea expedition and harbour research, Oceana documented a number of unsustainable fishing practices. The findings included several large fishing vessels still officially registered as driftnetters, even though the driftnet ban in the Baltic Sea has been in force since 2008. Additionally several "semi-driftnetters" were documented that use driftnets which are anchored on one side making it legal, as this type of driftnet was excluded from the driftnet ban but nevertheless has the same by-catch problem as conventional driftnets. Other findings included the unloading of cod in April in the Western Baltic Sea and in July and August in the Eastern Baltic Sea, despite the fact that fisheries in those months and areas are "closed" to preserve the cod stocks. Fish was also spotted being sold directly to consumers, inside and outside closed seasons, before or without being inspected to verify catch amounts. Furthermore, Oceana found it unacceptable that almost all Baltic sprat and an enormous amount of Baltic herring is caught for fishmeal and animal food, destined for highly controversial mink farms. These types of fisheries are unsustainable as they are carried out by large scale fishing vessels using very small mesh sizes which often take non-target and undersized fish.

Fishing net with float and rollers in the port of Rønne, Bornholm, Denmark. March 2011. © OCEANA/ LX

Recreational catches are high in the Baltic Sea and have often been underestimated in earlier years. Yet in certain areas, like the Sound and in the Kattegat, recreational catches are estimated to amount to up to 50% or more of commercial catches. In German Baltic coast, there are over 80 active cutters ("Fischkutter"), a lot of which are longer than 24 metres, that offer angling on a daily basis during most of the year for up to 50 anglers a day - a practice called "trolling" in commercial fisheries. These fisheries are almost entirely unregulated and catches are not included in quota amounts.

For the Baltic Sea's depleted fish stocks to recover, Oceana calls for the implementation of an ecosystem based fisheries management, taking into account the entire sensitive ecosystem, and the application of the precautionary approach. Besides better management, which must also include the management of all fish species caught, more stringent monitoring, control and surveillance in all Baltic Sea countries is needed, and catch reporting and fisheries management must include recreational fisheries. The selectivity of fishing gear needs to be improved and destructive fishing like bottom trawls has to be changed to prevent detrimental effects on the sea bottom as well as by-catch and discards. Finally, marine protected areas should provide sanctuaries for fish, while also shielding ecosystems from the effects of destructive fishing practices. Oceana finds it unacceptable that damaging activities, like trawling and dredging, are still allowed inside many marine protected areas in the Baltic Sea.

Artisanal fishing vessel, Piaski, Poland. April 2011.
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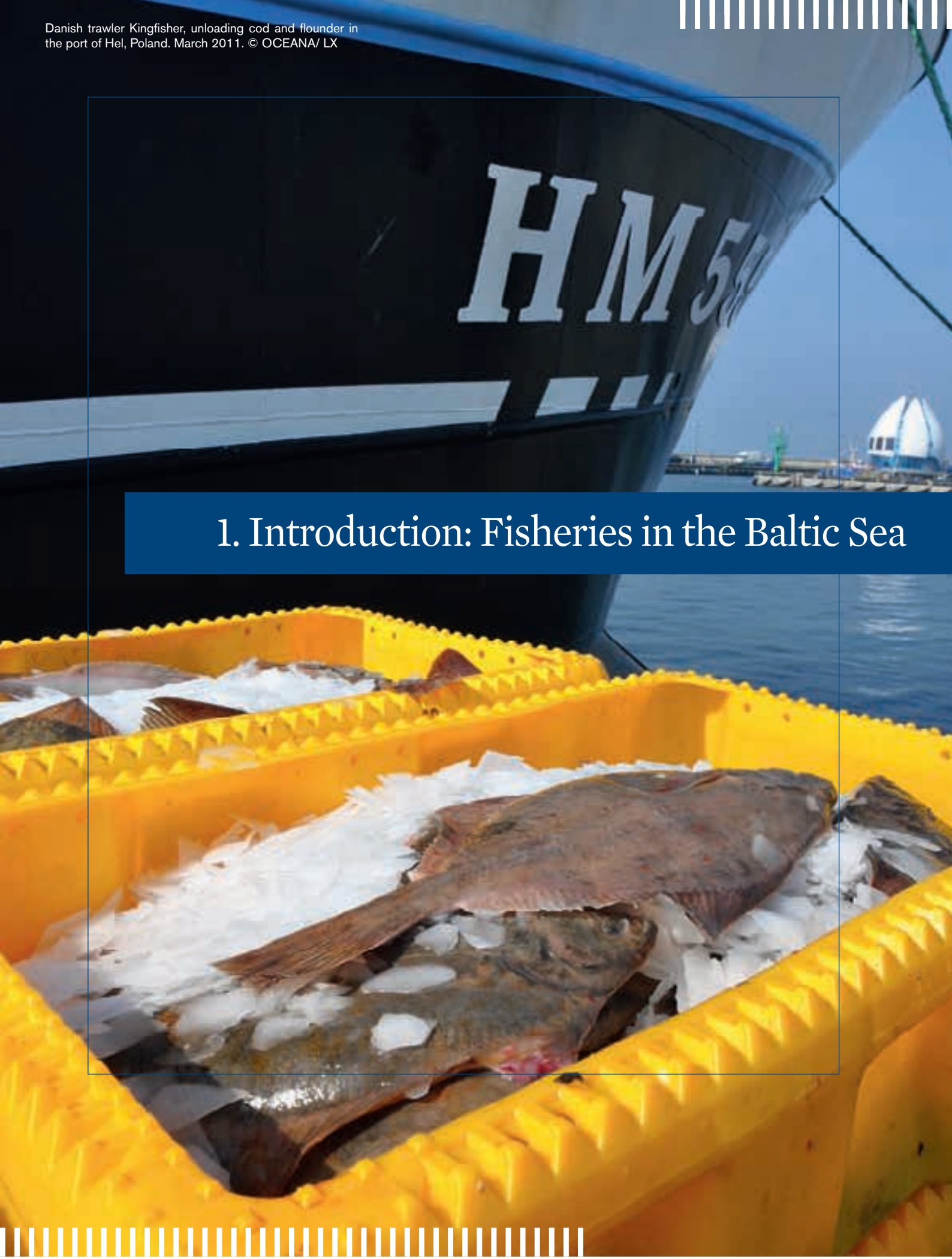


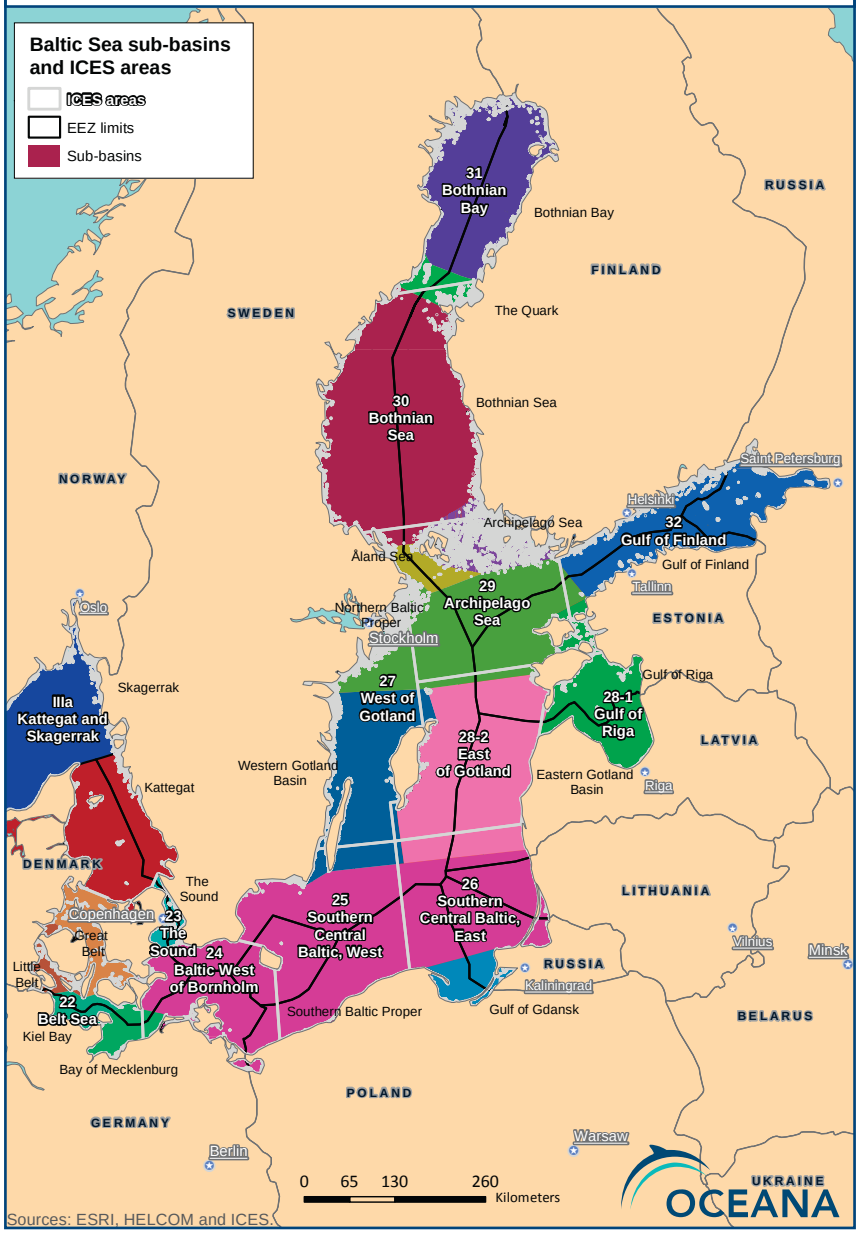
Danish trawler Kingfisher, unloading cod and flounder in the port of Hel, Poland. March 2011. © OCEANA/ LX

1. Introduction: Fisheries in the Baltic Sea

1.1. Baltic fishing countries, species and fisheries management

Fisheries have always been an integral part of cultures for the people living around the Baltic Sea. Records show that fishing activities were conducted along the Baltic Sea coast since well before the Middle Ages. Some of the best documented long-term fisheries in Europe are those in the Sound and Bohuslän regions in the Western Baltic Sea and Skagerrak, all targeting herring (*Clupea harengus*)[1], which was the most abundant and important species in the Medieval era. At that time, herring was also considered to be the largest fishery in the whole of Europe. The environmental situation in the Baltic Sea has drastically changed in the 20th century with dramatically increased fish landings[2,3] and increased pressure from human activities[4]. After the Second World War rapid industrialisation had a major impact on fishing in the Baltic. Small fisheries-based communities gradually began to vanish and, because more and more advanced technologies were introduced, the numbers of fishing vessels and professional fishermen have been continually decreasing[5].

Figure 1: Baltic Sea subdivisions of the International Council for the Exploration of the Sea (ICES)[6] and Kattegat and Skagerrak (subdivision IIIa)[7].



Today, the Baltic Sea is one of the most exploited and polluted seas in the world. High levels of nutrient inflow, mainly from agriculture, cause eutrophication and as a consequence massive algae blooms have become the largest problem with implications for the ecosystems and economies of the wider Baltic Sea region (Figure 1). Overfishing and contamination by hazardous substances, as well as sand and gravel extraction and oil and gas exploitation, are further threats. In addition, the rise in shipping, construction, pipelines, cables and offshore aquaculture places additional pressure on the sea's ecosystem[8]. Current commercial fishing practices have environmental impacts throughout the entire sea: several fish stocks are overfished, like cod in the Kattegat, herring and sprat, while others, like Baltic salmon, sea trout and eel have become threatened species. Fishing also affects mammals such as harbour porpoises, seals and sea birds which are accidentally caught as by-catch[9].

Table 1. 2010 reported catches by country in the Baltic Sea (ICES 2011)[10]. For the Kattegat and Skagerrak see Table 2.

Species/countries (2010 reported catches in tonnes)	Sweden	Finland	Poland	Denmark	Estonia	Latvia	Germany	Russian Fed.	Lithuania	Sum
European sprat (*Sprattus sprattus*)	79,985	24,601	59,276	48,181	47,861	45,852	17,753	25,647	10,223	359,379
Atlantic herring (*Clupea harengus*)	46,585	92,401	24,897	6,246	28,862	21,372	14,474	9,128	1,558	245,523
Atlantic cod (*Gadus morhua*)	11,546	1,028	12,155	17,616	796	5,160	8,158	4,252	3,200	63,911
European flounder (*Platichthys flesus*)	166	26	11,202	1,351	285	281	1,364	1,032	503	16,210
Blue mussel (*Mytilus edulis*)	-	-	-	6,600	-	-	-	-	-	6,600
European perch (*Perca fluviatilis*)	74	742	838	18	911	38	239	338	1	3,199
European smelt (*Osmerus eperlanus*)	-	497	-	-	453	1,127	-	247	17	2,341
Roach (*Rutilus rutilus*)	-	227	601	-	64	11	329	765	-	1,997
European plaice (*Pleuronectes platessa*)	101	3	38	1,448	-	-	299	-	-	1,889
Freshwater bream (*Abramis brama*)	3	741	590	-	-	61	204	1,424	1	1,392
Vendace (*Coregonus albula*)	1,038	133	-	-	-	-	-	11	-	1,182
Pike-perch (*Stizostedion lucioperca*)	16	352	152	-	73	6	131	426	9	1,165
Common dab (*Limanda limanda*)	3	-	-	544	-	-	417	-	-	964
European eel (*Anguilla anguilla*)	307	-	54	373	3	1	74	16	-	828
Whiting (*Merlangius merlangus*)	48	7	89	314	-	-	295	-	-	753
Atlantic salmon (*Salmo salar*)	300	215	48	130	4	4	8	1	1	711
Pollock (*Pollachius pollachius*)	0	647	-	0	-	-	-	-	-	647
Sandeels (=Sandlances) nei (*Ammodytes* spp.)	-	-	1	597	-	-	-	-	-	598
Sea trout (*Salmo trutta*)	25	54	372	8	12	5	12	-	-	488
Other species	314	408	211	821	247	127	451	991	27	3,597
Total	**140,511**	**122,082**	**110,524**	**84,247**	**79,571**	**74,045**	**44,208**	**44,278**	**15,540**	**713,374**

Edible crab in Kattegat, Denmark. May 2011.
© OCEANA/ Carlos Minguell

In 2010, the total reported amount of all fish caught in the Baltic Sea was 713,374 tonnes. From the Kattegat and Skagerrak the catch in 2010 was 96,924 tonnes (Table 1, Table 2). Out of nine countries that have shorelines along the Baltic Sea the largest fishing nations in terms of catches are Sweden (19.70%), Finland (17.11%) and Poland (15.50%). Additional unreported catches have been estimated up to 30% to 40% in some fisheries.[11]

The countries surrounding the Baltic Sea catch more than 50 different fish species in commercial fisheries,[12] where the main target species, cod, herring and sprat, constitute about 93% of the total reported catch[13] and provide the highest total income to fishermen. Herring and sprat catches make up about 46% of total catches in the Kattegat and Skagerrak. Other fish species caught frequently are *inter alia* European flounder, perch, smelt, roach, sea trout, European plaice, common dab, brill (*Scophthalmus rhombus*), turbot (*Psetta maxima*) and European eel.

Greater weever in Kattegat, Sweden. April 2011.
© OCEANA

Table 2. 2010 reported catches by country in the Kattegat and Skagerrak (ICES 2011)[14].

Species/countries (reported catches in tonnes)	Denmark	Sweden	Norway	Germany	Other[15]	Sum
Atlantic herring (*Clupea harengus*)	7,610	20,138	3,282	146	1,078	32,254
European sprat (*Sprattus sprattus*)	10,195	1,420	914	308	308	13,145
Sandeels (*Ammodytes* spp.)	9,285	720	-	-	0	10,005
European plaice (*Pleuronectes platessa*)	7,278	193	49	17	1,537	9,074
Saithe (*Pollachius virens*)	3,565	710	1,155	365	365	6,160
Northern prawn (*Pandalus borealis*)	1,125	1,508	2,598	-	0	5,231
Norway lobster (*Nephrops norvegicus*)	3,723	1,252	125	30	30	5,160
Atlantic cod (*Gadus morhua*)	3,400	497	433	56	82	4,468
Blue mussel (*Mytilus edulis*)	1,787	52	-	-	0	1,839
Atlantic mackerel (*Scomber scombrus*)	52	274	1,236	-	0	1,562
Haddock (*Melanogrammus aeglefinus*)	1,139	126	94	65	66	1,490
Other	3,511	947	1,822	48	256	6,536
Sum	52,670	27,837	11,708	1,035	3,722	96,924

Further species that are commercially caught in the Baltic Sea and the Kattegat, as well as in the Skagerrak and North Sea, need to be properly managed, differentiated and evaluated. Among these, there are crustaceans like northern prawn (*Pandalus borealis*), Baltic shrimp (*Palaemon adspersus*), European lobster (*Homarus gammarus*), edible crab (*Cancer pagurus*), marine crab (*Carcinus maenas*), etc., molluscs like scallop (*Pecten maximus*), razor shells (*Ensis* spp.) and other fish species, like whiting (*Merlangius merlangus*), Greenland halibut (*Reinhardtius hippoglossoides*), witch flounder (*Glyptocephalus cynoglossus*), greater weaver (*Trachinus draco*), etc.

In 2012, total fish landings from Baltic Sea European Union (EU) countries had a total value of €219 million, measured by first sale income for fishermen. Sweden has the largest income from fisheries in the Baltic Sea. While Denmark is only the fourth largest fishing nation in the Baltic in terms of tonnage, it has the second highest income from Baltic fisheries. On the other hand, while Finland is the second largest nation in terms of catches in tonnes, it is only in 5th place in terms of income, indicating a relatively low income from Baltic fisheries (Table 3).

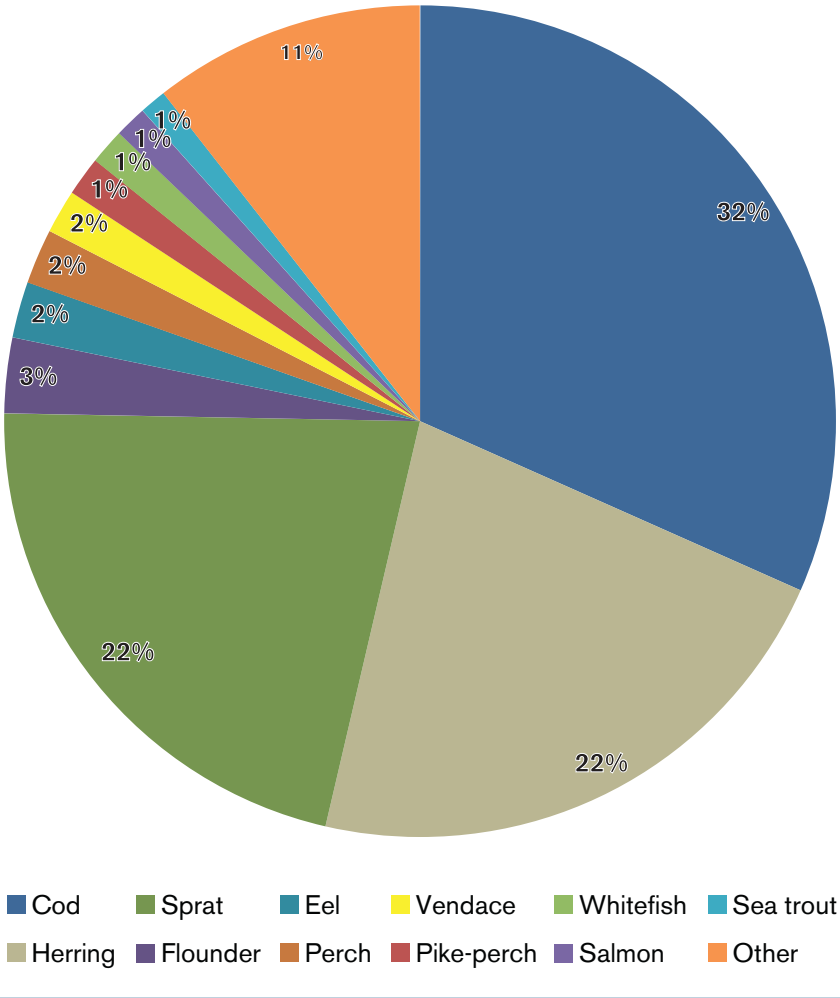
Flounder in the Northern Baltic Proper, Sweden. April 2011. © OCEANA/ Carlos Minguell

Table 3. 2010 reported catches by country and income from fisheries from the Baltic Sea excluding the Kattegat[16,17].

Country	Catch (tonnes)	Catch (%)	Catch income (1000 €)	Catch income (%)
Sweden	140,511	21.00	48,902	22.28
Finland	122,082	18.25	24,583	11.20
Poland	110,524	16.52	39,957	18.20
Latvia	74,045	11.07	20,439	9.31
Estonia	79,571	11.89	12,915	5.88
Denmark	84,247	12.59	42,299	19.27
Germany	44,208	6.61	30,400	13.85
Total	**669,096**	**100.00**	**219,495**	**100.00**

Baltic cod provides the highest income for fishermen all together, making up almost one-third in 2010. Herring and sprat come next, accounting for 22% each of the total turnover from catches. However, sprat and herring have a low economic value, when compared to the tonnage of catches, because they are caught both for human consumption and animal food/fishmeal production.

Figure 2: Relative income from the Baltic Sea fisheries, excluding Kattegat in 2010 (STEFC 2011)[18].

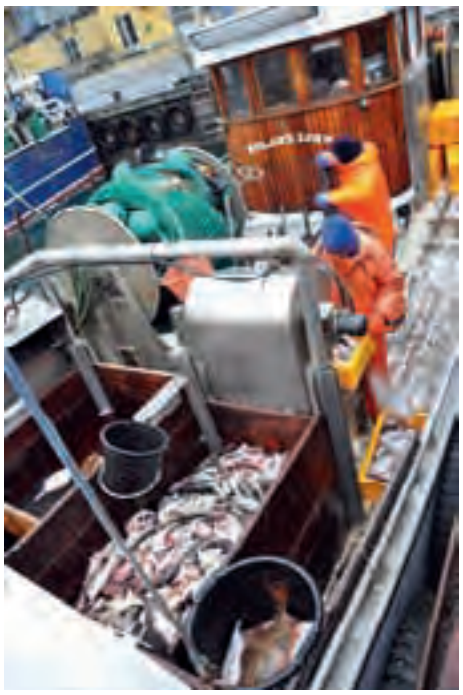


Of all species caught in the Baltic Sea, sole (€13.4 kg), Norway lobster (€8.2 kg), eel (€7.01 kg), brill (€5.70 kg), common prawn (€5.60 kg), sea trout (€4.85 kg), pike perch (€4.80 kg), salmon (€4.18 kg) and European whitefish (€3.75 kg) fetch the highest prices. Sprat (€0.15 kg) and herring (€0.21 kg) provide fishermen the lowest income per kg caught, while cod (€1.20 kg) is at the lower end of the scale[19]. Having a larger variety of carefully managed species for fisheries would make economic sense as other species than sprat and herring have much a higher value for consumers and therefore provide relatively higher income for fishermen (Figure 2).

Management of Baltic Sea fish stocks

Fisheries in the Baltic Sea, Skagerrak and Kattegat are managed by different regimes. As in other European seas, fisheries management falls within the jurisdiction of EU's Common Fisheries Policy. Inside 12 nautical miles (nm), fisheries are managed mostly by coastal EU Member States. But also outside the 12 nm, for the entire Exclusive Economic Zones, countries are able to set fisheries management measures for their own fleets, regardless of where those fleets are operating as long as those fisheries management measures are not less stringent than the CFP[20]. The European Habitats Directive[21] foresees the establishment of a network of Marine Protected Areas, the marine Natura 2000 network, and management measures for those areas and species mentioned in the directive, as a way to secure the status of species and habitats of community interest on a long term basis. Protected species under the Habitats Directive include harbour porpoises, seals, and fish like salmon and eel. The European Marine Strategy Framework Directive[22] constitutes the environmental pillar of the EU's Integrated Maritime Policy, including fisheries, and requires good environmental status for European seas, one of the benchmarks being to get fish stocks at Maximum Sustainable Yield (MSY) levels. MSY describes the largest yield, or catch, that can be taken from a stock over an indefinite period, while still maintaining population size at the point of maximum growth. International commitments like the Johannesburg declaration[23] also require that EU fish stocks reach MSY by 2015. Currently, most of the Baltic fish stocks are overfished beyond MSY[24].

A number of commercially important fisheries in Europe are managed with catch limits, known as Total Allowable Catches (TACs), which are later divided into fishing quotas by countries. While more than 50 different species of fish are commercially caught in the Baltic Sea, in 2011, the European Commission proposed Baltic TACs for only five of them. TAC proposals are based on scientific advice, which takes into consideration many factors, including the state of the stock, previous years' recruitment estimates, etc. Advice is given annually by the International Council for the Exploration of the Seas (ICES) and reviewed by the EU Scientific, Technical and Economic Committee for Fisheries (STECF). On the basis of this advice, TACs are proposed by the European Commission and decided upon by the Agriculture and Fisheries Council of the European Union, which consists of Fisheries Ministers from all EU Member States. The main problem during this process is that ministers have traditionally ignored much of the scientific advice, setting TACs that were much higher than proposed, resulting in heavily overfished stocks. In 2011 for example, the TAC for Baltic salmon was set more than twice as high as the scientific advice for the Baltic Sea and 50% higher than advice for the Gulf of Finland, while the TAC for Baltic plaice was set 30% higher than the advice.



Unloading cod and flatfish from a trawler in the port of Tejn, Bornholm, Denmark. March 2011. © OCEANA/ LX

Table 4 gives an overview on Baltic fish stocks and the status of their stocks. According to ICES advice for 2012, the western Baltic cod stock is overfished in relation to MSY and the average recruitment has been much lower than historically recorded levels. This is noteworthy because cod fishery is highly dependent on recruiting year classes, and while the eastern Baltic stock has shown some recovery. The status of the sprat stock in the Kattegat (and Skagerrak) is not known and catches should therefore be reduced. In the Baltic Sea (sub-divisions 22-32) the stock is fished above MSY. Herring stocks in all ICES subdivisions are fished unsustainably above MSY, except in the Gulf of Riga, the Bothnian Sea and the Bothnian Bay. In the Bothnian Sea, the status of the stock is good whereas in the Bothnian Bay, the herring status is unknown.

Table 4. ICES advice and fishing quotas for 2012 in the Baltic Sea, the Kattegat and the Skagerrak. Red colour indicates Council agreements where scientific advice was not followed. (ICES; Council of the European Union, October 2011; HELCOM 2007)[25,26,27].

Stock	ICES Advice 2012[a]	EC Proposal 2012	Council Agreement 2012	Status of the stock		Total reported catches 2010
	Tonnes	Tonnes	Tonnes	ICES 2011	HELCOM 2007	Tonnes
Herring Gulf of Bothnia	104,000	106,000	**106,000**	Bothnian Bay: Unknown Bothnian Sea: Fished appropriately in relation to MSY		277,631
Herring Western Baltic and Kattegat/Skagerrak spring spawning herring	42,700	20,900	20,900	Fished above MSY		
Herring Eastern Baltic except Gulf of Bothnia	92,000	72,178	78,417	Fished above MSY, fished unsustainably in relation to the precautionary approach		
Herring Gulf of Riga	25,500	28,878	**30,576**			
Cod Eastern Baltic	74,200	67,850	67,850	Fished appropriately in relation to MSY, fished sustainably in relation to the precautionary approach	Threatened/ declining	68,323
Cod Western Baltic	21,300	21,300	21,300	Fished above MSY	Threatened/ declining	
Cod Kattegat	No fishing	0	0	Unknown	Threatened/ declining	
Plaice Baltic Sea	Catches should not increase	2,281	**2,889**	Unknown		10,946
Salmon[b] Baltic Sea except Gulf of Finland	54,000	52,904	**122,553**	Among the 27 assessed rivers, 13 are unlikely to reach 50% survival rate of young salmons and for 6 rivers, the situation is uncertain	Threatened/ declining	712
Salmon[b] Gulf of Finland	No fishing	10,884	**15,419**			
Sprat Baltic Sea	242,000	213,110	225,237	Fished above MSY, harvested unsustainably in relation to the precautionary approach		359,379

a_Including the Russian quotas
b_TAC is given in number of individuals, not in tonnes

1.2. The Baltic fishing fleet

Growing demand for fish and fish products and the availability of fishing subsidies, combined with increasing resource depletion in the Baltic as in all EU waters, has promoted the expansion of European fishing fleets in both size and range over the last few decades. Today, the EU fleet is estimated to be two to three times greater than what sustainable fisheries limits would allow[28].

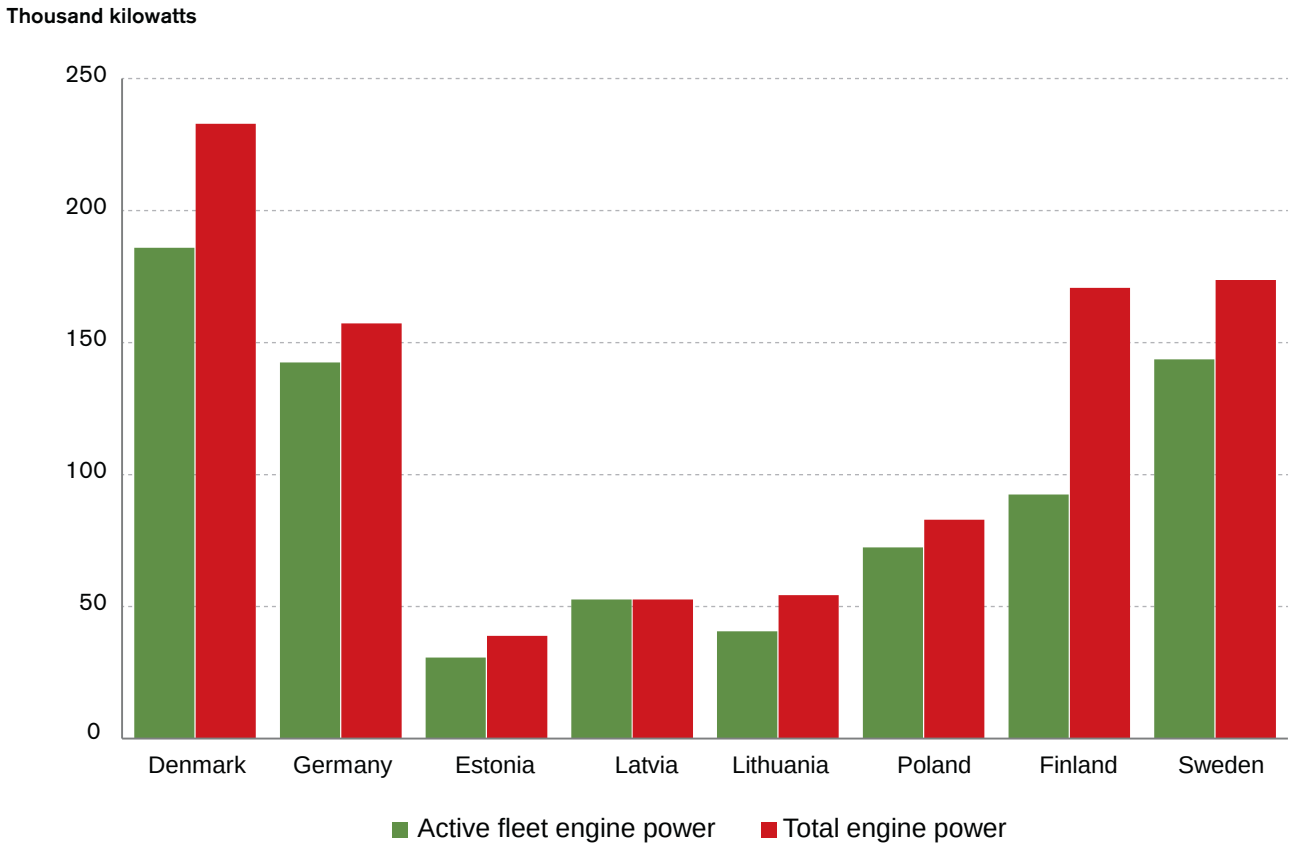
Fishing subsidies, defined as direct or indirect financial transfers of funds from public entities that help make the fishing sector more profitable than it would be without additional funding, can create incentives to fish more, even when catches are declining[29]. This type of funding results in overfishing, fleet overcapitalization, reduced economic efficiency and failure to realize the potential economic benefits from the resource[30]. Fleet overcapacity affects fisheries management in many ways: it leads to political demands to prevent the establishment of TAC's, disregard scientific advice on the reduction of catch limits, supports IUU fishing and reduces the profitability of operators. Excessive fishing activities also damage the marine environment, particularly through overfishing, destructive impact on the seafloor and increased catches of non-target and protected species[31].

Overcapacity has been the largest problem with the EU fishing fleet for decades, leading to TACs that have been set too high and massive overfishing. The Baltic Sea is no exception to this problem. The largest fleets among the Baltic EU Member States, in terms of total power, measured in kilowatts (kW), belong to Denmark (ca. 233,000 kW), Sweden (ca. 174,000 kW), Finland (ca. 170,000 kW) and Germany (ca. 157,000 kW) (Figure 3). In terms of tonnage Germany, Denmark and Lithuania have the largest capacity, while Finland has the most vessels (3,325 total registered in 2012), followed by Denmark and Germany[32].

Furthermore, overfishing and the availability of subsidies for the cessation of fishing activities have led to high numbers of fishing boats in the Baltic Sea countries, reported as "inactive". Finland declares more than 50% of its vessels to be "inactive", while Denmark reports about 40%[33]. Figure 3 shows the discrepancies between total registered engine power and active vessels engine power of Baltic Sea countries.

Former German trawler Seeschwalbe, retired as War-101 from EU fleet register in 1991, re-entered EU fleet register as Hel 125 in 2004 and trawlers in the port of Hel, Poland. March 2011. © OCEANA/ LX

Figure 3: Fishing fleet engine power by Baltic Sea country (Eurostat 2011)[34].



Swedish bottom trawler Ingun, constructed in the year 2000 with more than half a million Euro EU fishing subsidies, sailing in Kattegat, Sweden. May 2011. © OCEANA/ Carlos Minguell

Estonian midwater trawler Kotkas in the port of Tallinn, Estonia. May 2011. © OCEANA/ Carlos Suárez

Fishing vessels in the port of Ustka, Poland. March 2011. © OCEANA/ LX

Vessels in the port of Władysławowo, Poland. April 2011. © OCEANA/ LX

Artisanal fisheries in the Baltic Sea

Small-scale, artisanal fishing vessels[35] represent over 83% (~70,000 vessels) of the total fleet in the EU, and are defined as vessels shorter than 12m without towed fishing gear. Supporting the artisanal fishing fleet segment is an important and widespread objective in many EU Member States, due to the economic benefits and employment opportunities that such fleets provide. Artisanal fisheries produce around €2,1 billion worth of landed fish which accounts for 27% of the value of all fish catches in the entire EU. On average some 90,000 fishermen are employed in this sector compared to about 78,000 employed on board vessels over 12 metres long. At the same time, this segment only accounts for about 10% of the total gross tonnage of the European fleet and about 35% of its engine power[36].

In general, artisanal fleets operate in a more environmentally friendly way, using no bottom trawls, mostly passive gears and producing little or no discards. Artisanal fisheries have other advantages as well. For example, almost no catch taken by the artisanal fisheries end up as fishmeal or fish oil to feed fish farms, whereas most of the fish caught in large-scale fisheries in the Baltic are used for industrial purposes. On top of that artisanal fisheries provide generally higher quality, fresh products, generate less by-catch and employ more fishermen in relation to the biomass of landed fish[37].

Artisanal fshing vessels on thebeach of Kąty Rybackie, Poland. April 2011. © OCEANA/ LX

Artisinal fishing vessel at the beach of Gdynia, Poland. August 2007. © OCEANA/ LX

When it comes to CO_2 emissions, artisanal fleets have a much smaller carbon footprint than large fleets. Small-scale fishing vessels use one tonne of fuel to produce four to eight (in the best case scenario) tonnes of fish[38]. This means that using the same amount of fuel, small-scale fisheries produce up to four times as much fish as industrial fisheries. Therefore, a solution for reducing fishing mortality in depleted resources, while maintaining most social benefits, is to phase out large-scale fisheries in favour of the artisanal model. However, artisanal fishing fleets can also pose problems to the ecosystem, they need to be managed and controlled carefully, catches have to be reported correctly and also passive nets have to be operated in a way that by-catch is minimized.

Of the 6,841 total active fishing vessels in the Baltic Sea, only 15% are larger than 12 metres. The remaining 85%, made up of vessels smaller than 12 metres, is only responsible for 9% of the total catch in tonnes in the Baltic Sea. Finland, which has the most active fishing vessels, has few that are over 12 metres and no active bottom trawlers larger than 12 metres. Sweden, the country with most fish catches in the Baltic Sea has the second most vessels in total, and 22% of its vessels are larger than 12 metres.

The significance of the few larger vessels in the Baltic Sea becomes clear, when the catches per length class are further analysed. Vessels between 12 and 24 metres long bring in 20% of the reported Baltic catch, while vessels larger than 24 metres are responsible for 71% of the total catch. To illustrate these figures: 35 Swedish mid-water trawlers larger than 24 metres catch twice as much fish as the reported catch of the entire Baltic fishing fleet smaller than 12 metres[39]. Table 5 describes the fishing fleets in the Baltic Sea and the Kattegat.

Table 5. Catches by Baltic Sea country, gears and length classes in 2010 (STECF 2011)[40].

Country, % of total catch/ vessel gear and length classes (number of fishing vessels)	Artisanal, passive/ active gear (0-12m)	Bottom trawlers (0-12m)	Passive and active gears (12-24m)	Drift-/fixed gillnetters (12-24m)	Mid-water trawlers (12-24m)	Bottom trawlers (12-24m)	Mid-water trawlers (24+m)	Gillnetters (24+m)	Bottom trawlers (24+m)	Total vessels larger 12 m	Total fishing vessels
Poland	576			86	56	93	3		25	263	839
Sweden	825	64		27		162	35		32	256	1,145
Denmark	613	11	61			131			0	192	816
Latvia	736					30	66	26		122	858
Finland	1,486		0	18	33		16		0	67	1,553
Estonia	878				24		40			64	942
Germany	960	7		8	1	36	2	3	6	56	1,023
Lithuania	78			13	8		16			37	115
Total	**6,152**	**82**	**61**	**152**	**122**	**452**	**178**	**29**	**63**	**1,057**	**6,841**
% of the total catch	**9%**		**20%**				**71%**				

Artisanal fishing vessels on the beach of Chlopy, Poland. April 2011. © OCEANA/ LX

Artisanal fishing vessels on the beach of Kąty Rybackie, Poland. April 2011. © OCEANA/ LX

Polish trawler with sprats onboard a vessel in Kołobrzeg, Poland. April 2011. © OCEANA/ LX

2. The biggest problems

2.1. Overfishing, destructive and problematic fishing methods

Total annual catches in the Baltic Sea currently stand at 713,000 tonnes. During the past half century Baltic fisheries have seen an enormous shift from a sustainable and artisanal fishing practices to an international industry, relying on large industrial fishing vessels, fish location technology, on-board treatment and storage, that is much more detrimental to the environment. Large scale fisheries in the open Baltic Sea mainly target cod, herring, sprat, plaice, flounder, mussels, salmon and sea trout. Coastal fisheries, on the other hand, target species such as European whitefish (*Coregonus lavaretus*), northern pike (*Esox lucius*) and pike-perch.

Besides removing target species, fishing also affects the structure of the food-web by removing large predatory species like cod and salmon, which play an important role in regulating the lower trophic levels. Several recent analyses have shown that overexploitation has contributed to ecosystem regime shifts in the Baltic Sea (see Box 1), and even enhanced eutrophication[41]. Fisheries account for large scale pressures in the Baltic Sea (Figure 4). Bottom trawling and the by-catch of marine mammals and seabirds in bottom-set gillnets are obstacles facing the Baltic Sea, as indicated by a recent project[42] on environmentally sound fisheries practices.

Northern pike in the port of Dziwnów, Poland. April 2011. © OCEANA/ LX

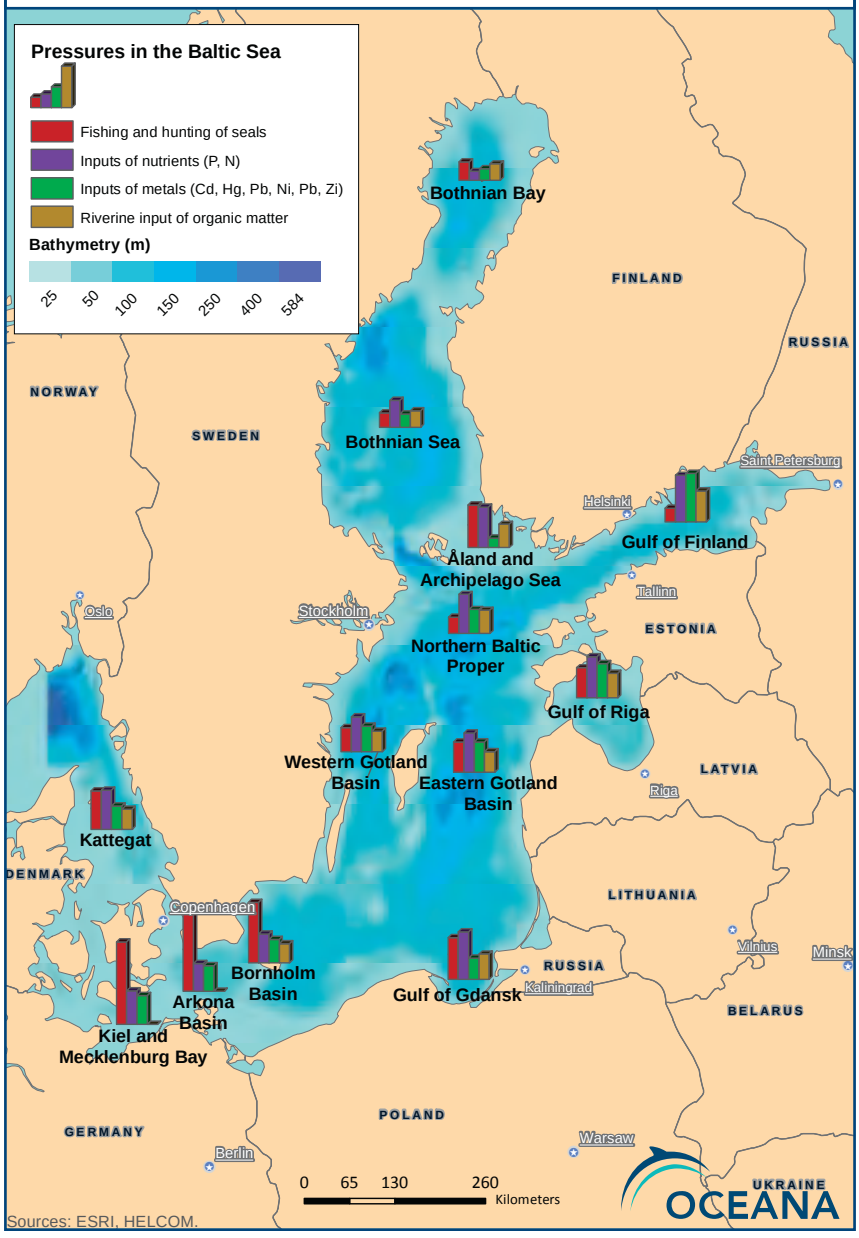
Ecosystem changes in the Baltic Sea

The Baltic Sea ecosystem has undergone prominent structural changes and regimes shifts over the last three decades caused by the combination of different stressors, like fisheries, eutrophication and climate change[43]. These changes have altered the functioning and the composition of the zooplankton and fish communities throughout the Baltic Sea. This has raised concerns of weakened ecosystem services of the Baltic Sea, like the production of fish for human consumption. Observed changes include for instance the decline of weight of herring since the late 1980s and the decline of cod, the main top predator[44,45]. At the same time sprat and warm water copepods (*Acartia* spp.) have increased[46] due to climatic changes and overfishing of cod. For the Baltic Sea herring, the decline in weight may be associated with a lower stock productivity since smaller females potentially lay fewer eggs and eggs of leaner females have lower hatchability[47].

It is assumed that the prime factor in the decline of cod is probably related to climatic variation, from a decline in the frequency of oxygenated and salty water inflow from the Northeast Atlantic since the 1980s[48], which is a prerequisite for the successful spawning of cod[49]. Unfavorable salinity conditions for cod spawning and the lack of key zooplankton species (e.g. *Pseudocalanus acuspes*) for cod larvae have further affected the recruitment failure of cod[50]. Historically cod has spawned at three known locations in the Baltic Sea: the Bornholm Deep, the Gdansk Deep and the Gotland Deep[51]. At present, favorable conditions for the spawning and production of viable larvae have only remained in the Bornholm Deep[52]. It is also anticipated that the large sprat stock has exerted high predation pressure on cod eggs[53,54], further worsening the status of the cod stock.

However, recently the eastern Baltic cod stock has recovered after more than two decades of low biomass and productivity. Environmental conditions have not changed significantly but there has been a reduction in mortality caused by fishing, implying that this increase in stock is driven by a decrease in fishing pressure[55].

Figure 4: Area-specific pressures and their potential impacts on the ecosystem for each sub-basin according to the HELCOM Baltic Sea Impact Index. Fisheries (and the hunting of seals) related impacts are the major pressure in five out of the 13 sub-basins and the second largest pressure in three other sub-basins. The potential impacts and their magnitudes are comparable across basins. For more information on the HELCOM Baltic Sea Impact Index and the categories used in the map, see HELCOM 2010[56].



Polish vessel Zag 31 unloading sprats in the port of Hel, Poland. March 2011. © OCEANA/ LX

Fishing causes the unintentional by-catch of non-target species such as benthic invertebrates, other fish species, undersized target species, seabirds, and marine mammals. Bottom trawling and dredging are the fishing methods with the largest by-catch of non-target fish species, some of which are threatened and/or declining[57].

Dredging of blue mussels in Danish waters

Blue mussel (*M. edulis*) fishing is carried out in several areas in Danish waters: the Limfjord, along the east coast of Jutland in the Kattegat, the Belt Sea, and in the Wadden Sea[58]. Most of the blue mussels are dredged, which is a highly controversial fishing tech-

Lithuanian bottom trawler LBB - 1100 in the port of Liepaja, Latvia. May 2011. © OCEANA/ LX

nique as it destroys the sea bottom. The Limfjord is the area with the highest activity of blue mussel fishing, representing between 50-90% of the total blue mussel fishing in Denmark[59].

In 2010, Danish dredging vessels landed 1,700 tonnes of blue mussels from the Kattegat and Skagerrak and 7,000 tonnes from the Belt Sea. German dredgers landed 314 tonnes from the Belt Sea. Dredgers, like bottom trawlers use fishing gears with heavy weights that are dragged over the seafloor, changing physical structures and affecting surroundings[60]. The removal of blue mussels and shells can reduce the macro algae distribution, as macro algae depend on hard substrate, such as the shells, for adherence. Other organisms that can be affected by mussel dredging are benthic fauna, eelgrass, and birds foraging on blue mussels, such as the common goldeneye (*Bucephala clangula*). For benthic communities, it takes years to recover from dredging, and in some cases, for instance with eelgrass, it can take up to 20 years to recover. Mussel dredging is also taking place inside Natura 2000 sites[61]. Indeed, in 2010 about one third of the mussel dredging in the Limfjord was carried out inside these protected areas.

In the autumn of 2011, the Danish Ministry for Food, Agriculture and Fisheries granted permission to continue mussel dredging inside Natura 2000 sites. but the EU Commission is now preparing judicial proceedings in front of the European Court of Justice against Denmark as the environmental protection needs in Natura 2000 areas are not sufficiently taken into account. Licences for mussel dredging in Natura 2000 areas in the Baltic Sea, like in the little Belt, have to be postponed[62].

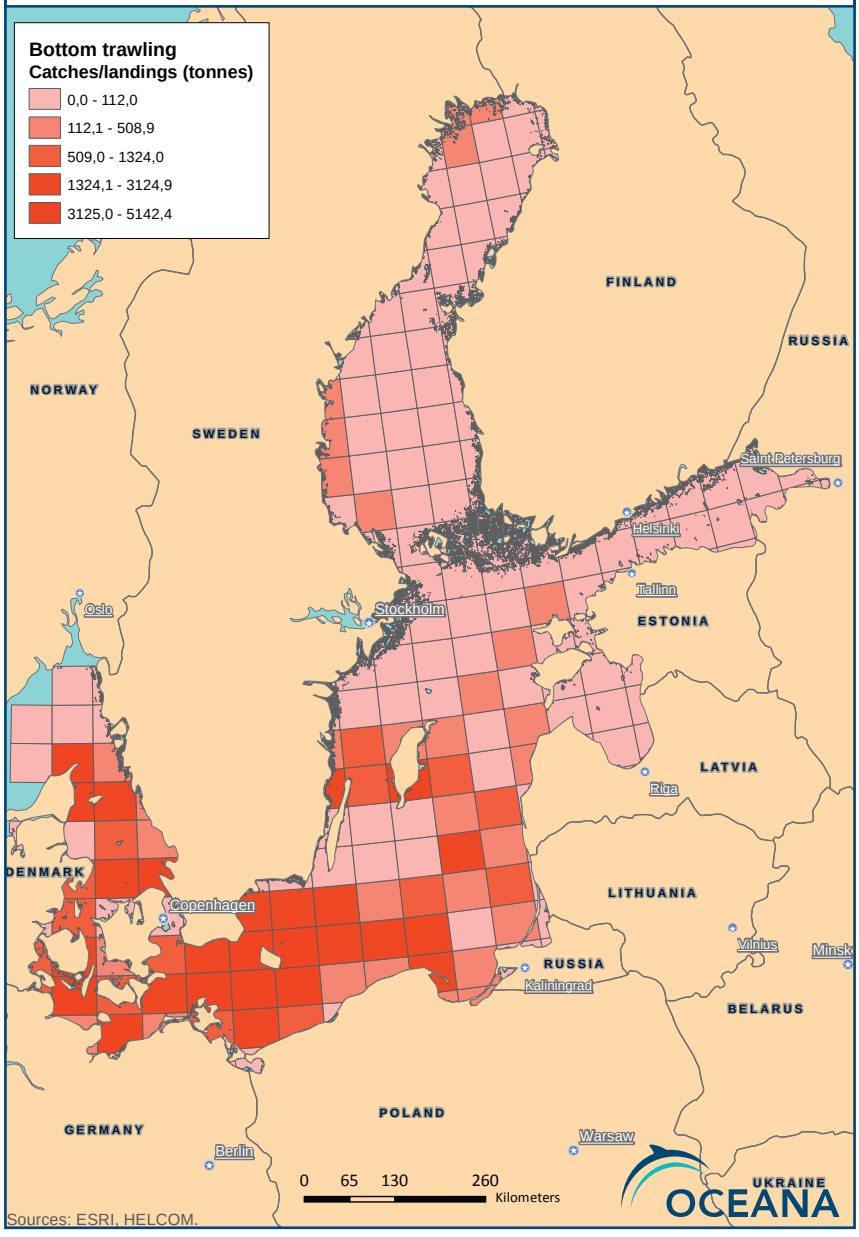
Bottom trawling marks in Kattegat, Denmark. May 2011. © OCEANA

Commercial bottom-trawling fishery

Bottom trawling is the most widespread destructive fishing method in the Baltic Sea and Kattegat. It physically disturbs the seafloor and results in high levels of by-catch. Bottom trawling is mainly practiced in the southern Baltic Sea, but also to a minor extent in the Bothnian Bay where vendace and herring are targeted (Figure 5). In the southern sea areas, bottom trawling targets many species of fish (cod, sprat, herring and flounder being the most common), prawns and lobsters. Fishing of crustaceans and mussels is limited to the Kattegat, the Limfjord and the Belt Sea[63].

Bottom trawling creates aisles of destruction that are several hundred metres long, trailing wide sediment clouds[64] and changing the physical and biological characteristics of the seabed[65]. The scale of impact depends on the intensity of the trawling. In intense bottom trawling areas, like in the Kattegat, this practice has degraded the state of the seabed.

Figure 5: Bottom trawling caches/landings (in tonnes) in the Baltic Sea. Data sources: national fisheries authorities/HELCOM[66].



Bottom trawling for Norway lobster and Northern prawn in the Kattegat and Skagerrak

The Norway lobster (*Nephrops norvegicus*) fishery is one of the most economically important fisheries in Denmark. Both Denmark and Sweden have *Nephrops* directed fisheries in the Kattegat. In 2010, Denmark accounted for about 80% of total landings in the Kattegat, while Sweden took 19%[67].

In the Kattegat and Skagerrak in 2010, *Nephrops* catches accounted for 53% and 25% respectively of the total value of fish and shellfish landed by Danish fishermen while cod landing accounted for 2% and 17% respectively. In the past 15 years, landings from the Kattegat and Skagerrak have varied between 3,700 tonnes and over 5,000 tonnes[68].

Nephrops are fished with heavy weighted bottom trawls that are dragged over the seafloor, badly disturbing it. By-catch and discard rates are high in this type of fishery reaching up to 50% (by-catch) and, according to a study[69], can comprise up to 24 different species. Despite the fact that ICES advice recommends a zero TAC for cod in the Kattegat, the by-catch rate for this species is high in the *Nephrops* fishery.

Pandalus borealis, the Northern prawn, is fished by bottom trawls in the Kattegat and Skagerrak at 150-400 metres depth throughout the year by Danish, Norwegian and Swedish fleets[70,71]. Total landings varied between 8,000 and 15,000 tonnes between 1985-2009, dropping to 5000 tonnes in 2010. Discarding is also a problem with the *Pandalus* fishery. Small and medium size prawns are discarded, mainly due to high grading[72]. There is also a by-catch of several valuable fish species, e.g. cod, flounder and anglerfish (*Lophius piscatorius*), Norway pout (*Trisopterus esmarkii*) and blue whiting (*Micromesistius poutassou*)[73].

The *Pandalus* fishery is managed by TACs, but the state of the stock is unknown. Landing per unit effort (lpue) indices have declined from 2008 onward. Also, survey biomass indices have declined since 2007 and the recruitment index is low[74]. Based on precautionary considerations, ICES is advising to reduce catches and also stresses that measures addressing discarding should be implemented[75].

Beam trawling in the Western Baltic Sea and the Kattegat/Skagerrak

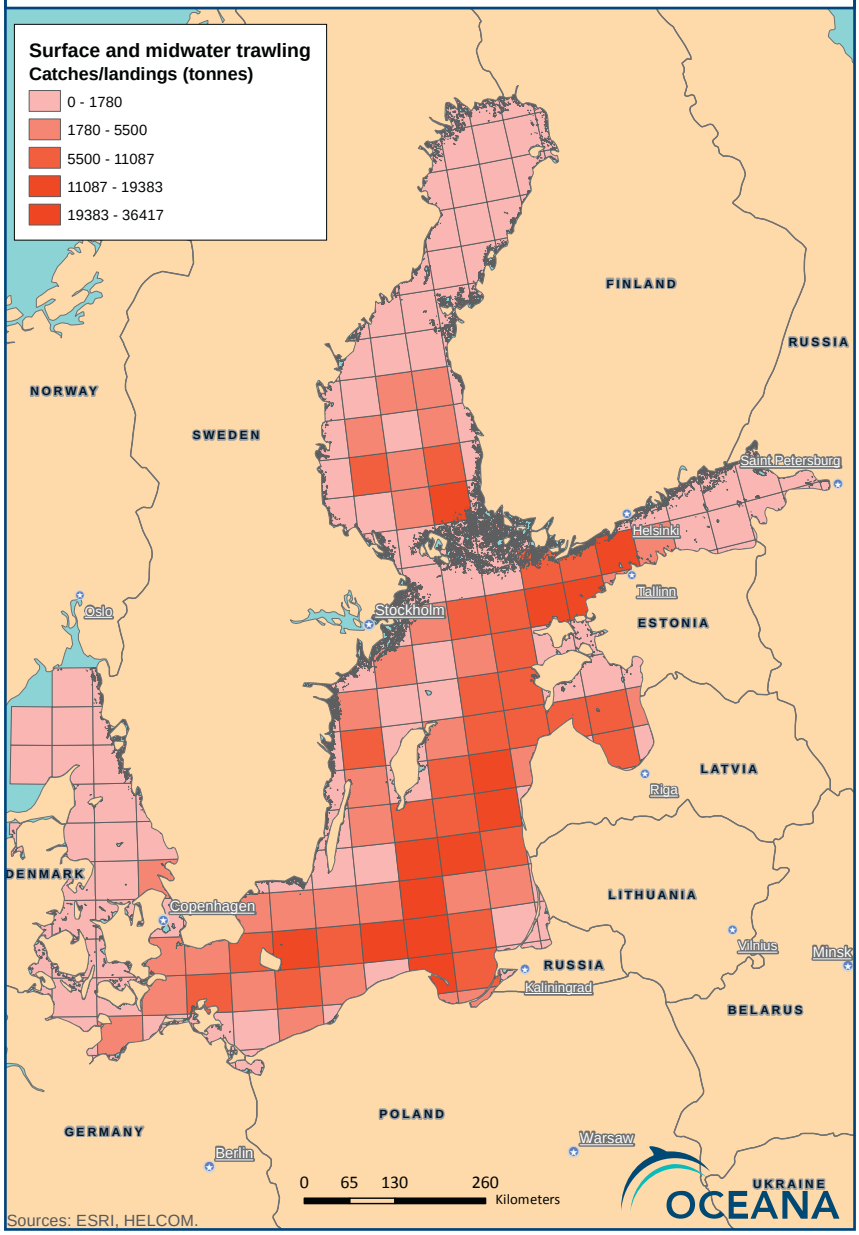
Beam trawling is a destructive fishing technique in which a net is held open by a steel beam. Usually a vessel tows two of these nets over the seafloor. The nets are typically fitted with heavy chains which scrape the bottom and destroy marine life on the seafloor. In 2010, German beam trawlers operated in the Western Baltic Sea, catching 123 tonnes of fish, of which 70% was cod. Dutch beam trawlers operated in the Kattegat and Skagerrak, catching 1,200 tons of fish, of which 80% was plaice and dab[76].

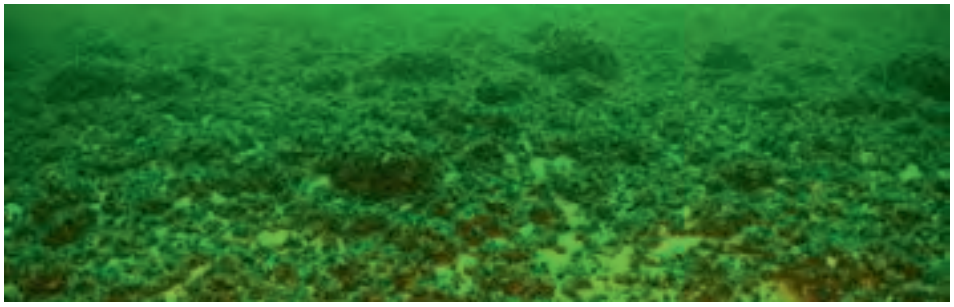
Blue mussel with bryozoans in Kalmarsund, Western Gotland Basin, Sweden. April 2011. © OCEANA/ Carlos Minguell

Pelagic mid-water trawling

Mid-water trawling causes, mainly due to very small meshed nets, pressure on target fish species and leads to the catch of undersized fish and non-target species[77]. Mid-water trawlers from Poland and Latvia catch by far the most fish with this gear type in the Baltic Sea. The largest catches with this type of gear come from the Arkona and Bornholm Basins, Eastern Baltic Proper and from the Bothnian Sea and are comprised mainly of sprat and herring, the "target species", as well as of cod, and plaice[78] (Figure 6).

Figure 6: Catches/landings (in tonnes) from surface and mid-water trawling in the Baltic Sea. Data sources: national fisheries authorities/HELCOM[79].





Blue mussel bed, Arkona Basin, Denmark. June 2011. © OCEANA

Discards and by-catch in the Baltic Sea

Discards and by-catch, caused by the use of non-selective fishing gear, are two closely related problems. By-catch is the portion of the catch that is not comprised of the fishery's target species and discards are the portion that is thrown back into the sea for several reasons.

Discards and by-catch are a serious problem in the Baltic Sea, particularly in dredging and bottom trawling fisheries for cod, *Nephrops* and *Pandalus*[80]. Sometimes the discarded catch are commercially valuable, but less so than a later catch by the same vessel. This is known as high grading, when part of the catch is classified and discarded in order to conserve only the most valuable catch. High grading has been prohibited in all Baltic fisheries, since 1st January 2010, yet the ban contains loopholes. The by-catch of marine mammals and sea birds in the Baltic Sea is problematic[81] and the by-catch of non-target fisheries, particularly cod is high in certain gear types.

Cod discards and by-catch in the Kattegat

Discards of cod in the Kattegat are extremely high and are currently estimated at a similar level to reported landings. In numbers, 90% of individuals of cod caught in the Kattegat is estimated to be discarded[82].

Cod discards and by-catch in the Western Baltic Sea

ICES estimated that 1,400 tonnes of cod was discarded in 2010 - some 22% of the total cod catch in number of individuals, as estimated by ICES[83] - most of which came from trawlers. The most common age groups discarded are age groups 2, 3 and 4. There were also indications that high grading was occurring.

Cod discards and by-catch in the Eastern Baltic Sea

ICES has estimated that, in 2010 a total of 15% of the eastern cod catch in numbers of individuals was discarded. It is also believed that discards made in connection with unallocated landings consist mostly of high-grading. The discards were mainly of juvenile cod[84].

Discards and by-catch of sprat and herring

Discards and by-catch of sprat and herring are generally low because catches of non-target fish/undersized fish are used for fish meal and feeding animal farms. In fact, in the Baltic Sea, almost all of the sprat and much of the herring catches are used for fishmeal. Large mid-water trawlers, which make most of the catches, use extremely small mesh sizes. As all kinds of fish can be used in fishmeal factories, by-catch of undersized fish and non-target fish is not discarded but also processed. Some by-catch and discards of young sprat take place in the central Baltic Sea, but the amount of discarding of these age-groups is unknown[85]. In the mid-water trawl fishery for herring and sprat, the separation of herring and sprat catches is imprecise and there is a lack of discard data. In the Bothnian Sea and Bothnian Bay there are small amounts of sprat by-catch in the herring fishery, and also mixed landings of herring and sprat[86,87,88]. The by-catch of sprat and juvenile cod in herring fisheries is unknown for the Eastern Baltic Sea[89]. In the Gulf of Riga the by-catch of sprat is low, and by-catch of other species is insignificant[90].

Dead flounder, Åland Islands, Finland. May 2011. © OCEANA/ Carlos Suárez

Discards and by-catch of flatfish

Flatfish are often caught as by-catch in cod trawl fisheries. For the common sole (*Solea solea*) the available discard data is incomplete, but evidence from Sweden shows that the amount of flatfish discarded in bottom trawling for cod is high. Data on plaice fisheries in the Baltic Sea is poor, but by-catch occurs[91]. Turbot and brill are caught mainly as a by-catch of trawl and gillnet fisheries[92,93]. Dab is taken as by-catch in cod fisheries, but there is also targeted fishing of dab in the Sound[94].

By-catch of sea trout

Sea trout is caught in fisheries targeting whitefish, pike-perch and perch in the Gulf of Bothnia and the Gulf of Finland. Sea trout migrating offshore are largely caught in offshore salmon fishery. As no TAC exists for sea trout, national regulations can limit the amount of sea trout catch. Sweden has for example banned gillnet fishing in the Bothnian Bay during the spring and fall in waters with depth less than 3 metres for the sake of sea trout[95].

By-catch of harbour porpoises

Harbour porpoises were once abundant in the entire Baltic Sea, but the population has steadily decreased. Hunting for harbour porpoises started at the end of the 19th century, and in the last decades, by-catch in fishing gear and pollution, among other factors, have been responsible for this decline[96]. The population of Baltic Sea harbour porpoise is estimated to have stood at an average of 800 total individuals between 2002 and 2008[97]. They are red listed as "critically endangered" by the IUCN[98] and are threatened with extinction in the near future according to ASCOBANS[99]. The amount of by-catch of harbour porpoises in the Baltic is estimated at between 3.9% and 15.2% of the total population[100] - a percentage range that far surpasses the 1%-1.7% limit at which ASCOBANS and the International Whaling Commission deem by-catch levels to be "unacceptable interaction"[101]. The ASCOBANS Recovery Plan for Baltic Harbour Porpoises (Jastarnia plan) deems that a maximum of two by-caught individuals in the Eastern Baltic Sea is acceptable[102].

Dead common eider, Åland Islands, Finland. May 2011. © OCEANA/ Carlos Suárez

In Poland, the by-catch of harbour porpoises has been documented mainly in semi-driftnets and cod bottom gillnets. In 2009, two harbour porpoises were reported as by-catch and two as strandings in Polish waters[103]. In Germany a high number of harbour porpoise by-catch is documented every year. Recent German studies showed that between 2000 and 2009, the number of harbour porpoises found dead in the German Baltic coast increased from 25 to 152 individuals a year - of which 47% to 87% were caught in fishing nets.

Several measures have been taken in the past few years to improve the situation, including the obligation to use "pingers", acoustic devices that attempt to direct harbour porpoises away from the net, for gillnets in certain fisheries[104]. The marine station in Hel, together with the University of Gdansk is testing a system to protect whole fishing areas with acoustic barriers in the Puck bay. Germany has carried out a number of studies to replace fishing nets with gears that have no by-catch problems[105].

By-catch of birds

The Baltic Sea is a popular area for wintering diving water birds and many of their populations have declined over the last few decades. Of the 20-species of water birds covered by the report mentioned above, 11 have seen their total population size decreased, seven of which have seen a serious decline by more than 30% over 16 years. The estimated total number of wintering water birds between 2007 and 2009 was 4,41 million, compared to 7,44 million between 1992 and 1993 - a 41% reduction. A range of causes behind these declines has been suggested, including climate change, eutrophication, oil pollution and incidental by-catch[106], the latter of which is not considered to be the main threat. Coastal gillnet fisheries carried out in low depths are thought to be responsible for the most by-catch of birds in fishing gears. It is estimated that at least 76.000 birds are caught as by-catch in the Baltic Sea annually[107].

Lost nets

Lost nets are a problem in the Baltic Sea, as they continue fishing after being lost or abandoned, in particular from the gillnet fishery, but also from fisheries that use entangling and trammel nets. Tonnes of fish are caught in lost nets every year. The amount of lost nets, so called "ghost nets" in the Baltic Sea is estimated to be several thousand. They continue to catch fish they also pose a threat to reefs and bubbling reefs, as the nets can get caught into the reef, and therefore can be a physical blockage for animals and plants[108].

Grey seal, Northern Baltic Proper, Sweden. April 2011. © OCEANA/ Carlos Minguell

2.2. Unmanaged fisheries

In 2010, more than 50 different species of fish, totaling more than 800,000 tonnes, were caught in the Baltic Sea and the Kattegat. The European Commission however, has proposed a TAC for only five species in the Baltic, ignoring their own commitment to propose 25% precautionary reductions for stocks where data is lacking for scientific assessments, as is the case for most Baltic fish stocks[109]. Baltic TACs are set only for herring, sprat, cod, salmon and plaice, and only cod is subject to a multi annual fisheries management plan, while eel has to be managed by national eel management plans. Not included are species like sea trout, brill, dab, flounder and turbot, even though in 2012 ICES advised immediate fishing restrictions for sea trout, reducing the catches of flounder and turbot and not to increase catches for dab and brill.

Locally, in some countries or regions, a number of fisheries management measures like minimum landing sizes or fishing gear restrictions exist for some species, however a Baltic Sea-wide consistent fisheries management for those species is lacking. Countries are supposed to manage those fisheries that take place within 12 nautical miles of the shoreline through national legislation.

Table 6 gives an overview of the stock statuses and the ICES advice for fish species that are not managed with TACs in the Baltic Sea.

Baltic flounder, unloaded from a gillnetter in the port of Ustka, Poland, March 2011. © OCEANA/ LX

Table 6. Catches, ICES status of the stock and HELCOM status of unmanaged fisheries in the Baltic Sea[110,111].

Species	Total reported catches 2010 (tonnes) in the Baltic Sea	Total reported catches 2010 (tonnes) in Kattegat and Skagerrak	Status of the stock/Advice 2012 (ICES)	HELCOM status 2007	TAC 2012
Flounder	16,210	205	Unknown/Advice: Catches should be reduced		None
Turbot	356	95	Unknown/Catches should be reduced		None
Sea trout	488	-	Immediate fishing restrictions needed in all subdivisions	Threatened (VU=vulnerable)	None
Dab	964	589	Unknown/Catches should not be increased		None
Brill	80	122	Unknown/Catches should not be increased		None
Common sole	-	415	Kattegat: below target Baltic Sea: No advice		None
Perch	3,199	-	Not assessed/ No advice		None
Blue mussel	6,600	1,839	Not assessed/ No advice		None
Smelt	2,341	-	Not assessed/ No advice		None
Pike	336	-	Not assessed/ No advice		None
Roach	1,997	-	Not assessed/ No advice		None
Whitefish	49	-	Not assessed/ No advice		None
Pike-perch	1,165	-	Not assessed/ No advice		None
Freshwater breams nei (*Abramis* spp.)	1,632	-	Not assessed/ No advice		None
Whiting	753	195	Not assessed/ No advice		None
Vendace	1,182	-	Not assessed/ No advice	Threatened (VU=vulnerable)	None
Freshwater bream	1,392	-	Not assessed/ No advice		None
Garfish (*Belone belone*)	471	20	Not assessed/ No advice		None
Lemon sole (*Microstomus kitt*)	5	308	Not assessed/ No advice		None
Pollock	647	552	Not assessed/ No advice	Threatened (EN=endangered)	None

Flatfish

Of all Baltic flatfish, only the plaice stock has a TAC in the Baltic Sea. The plaice stock is at a low level and higher recruitment could not be observed[112]. Distribution of plaice is formed by salinity gradient and extends in the Baltic Sea eastwards to the Gulf of Gdansk and northwards to the Gotland area. The species is found only sporadically further north.

There are several distinct flounder stocks and migration between them is limited[113].

Flounder, despite having no TAC or agreed upon management measures, is frequently caught commercially in the Baltic Sea and sold for human consumption. Misreporting of flounder is a major problem. According to the latest ICES assessment, only about 50%, 20% and 15% of the flounder landings are reported from the southern Baltic Sea. Further north, especially in Sweden and Finland, recreational fisheries becomes increasingly important with a total catch that equals or even exceeds the commercial catch[114].

Turbot trapped in gillnet, Southern Baltic Proper, Germany. May 2011. © OCEANA/ Carlos Suárez

The stock status of brill, turbot and dab are unknown[115,116,117], and based on precautionary considerations, ICES advises that catches should not be increased.

2.3. Threatened fish species and their fisheries

Salmon

Atlantic salmon spend most of their lives in the sea, but migrate into their home rivers to spawn. Each of the salmon rivers contains a genetically unique population and therefore the loss of even a single river population is irreversible. The decline of Baltic salmon stocks started in the mid-19th century and has worsened since the late 1940s, due to the construction of hydroelectric power plants, damming and pollution of the rivers and river mouths. HELCOM has classified Atlantic salmon as endangered under International Union for Conservation of Nature and Natural Resources (IUCN) criteria[118]. It is also listed as critically endangered by Poland, as endangered by Denmark, Estonia, Finland, and Germany, and as a threatened migrant by Lithuania. Finally, it is also included in Annexes II and V of the EU Habitats Directive, which means that its conservation requires, besides other measures, the designation of protected areas. Even though Baltic salmon migrates between the open sea and rivers, protection according to the Habitats Directive is only needed in freshwater habitats and Atlantic salmon in Finnish rivers is excluded all together.

According to the ICES Working Group on Baltic salmon and sea trout, the reported total landings of salmon in the Baltic Sea have declined by 85% since 1990 and were at historic low levels in 2008. Improvements in the state of growth of the stock have occurred since. Unreported catches are estimated at around 40% of total catches.

Sea trout

The Baltic Sea contains approximately 1,000 sea trout populations of which about 500 reproduce naturally in the Baltic Sea rivers. Most of the sea trout rivers flow into the Main Basin. Sea trout is assessed as threatened under IUCN criteria and ICES advises imme-

diate fishing restrictions to be enforced in the Gulf of Bothnia and the Gulf of Finland, to safeguard the remaining wild sea trout populations in the region. Minimum mesh size for gillnets, and effort limitations should be implemented for the fisheries in the sea and in rivers carrying wild sea trout populations in order to reduce the exploitation rate[119].

Aside from setting a minimum landing size for sea trout, no other management measures or TACs have been agreed. The minimum landing size of sea trout is smaller than salmon and this has led to an increase in misreporting of undersized salmon as sea trout, which in addition to IUU fishing is a frequent problem in sea trout fisheries[120,121].

European eel

European eel is a 'catadromous' fish meaning that it spawns and is born at sea, and then migrates into inland waters to eat and grow. Eel is now believed to spawn in the Sargasso Sea in the middle of the North Atlantic, the larvae then migrate to the coasts of Europe by drifting in the Gulf Stream. There they congregate in estuaries as glass eels, before metamorphosing into elders and moving upstream. Eels spend six to 20 years of their lifespan in freshwater, where their bellies turn yellow. When the time comes to spawn, their skin turns silver and their stomachs dissolve. They then return downriver to swim the 5,000 kilometres back to the Sargasso Sea where their lives began. Eels can live for over 80 years and reach up to 130 cm in length, but average adult length is around 60-80 cm, when they weigh around 1-2 kg.

Traditionally eel fisheries have focused on adult eels and were aimed for local consumption. In the last few decades, however, the focus has shifted towards fishing glass eels, which are exported to Asian markets where they are fattened in farms before being sold. As a result, the price of glass eel has soared so high that in the mid-2000s it exceeded that of caviar. At present the fishing of eel relies on stocking with imported glass eels,[122] though ICES is concerned that glass eel stocking programs are unlikely to contribute to the recovery of the stock if fishing continues[123].

Eel stocks are severely depleted and urgent action is needed. European eel is one of the most broadly utilized fish in Europe and in 2003[124] ICES warned that eel stocks are about to collapse. It is classified as "critically endangered" by the IUCN - a threat level higher than that given to the polar bear (vulnerable), the giant panda (endangered) or the blue whale (endangered). Eel stocks have fallen to below 10% of 1970s levels and in the Baltic Sea 99% of the stocks are believed to have disappeared[125] - they continued to decline in 2011[126].

Moreover, according to ICES, the eel recruitment level is only 1% of what it was before 1980s. The glass eel recruitment trend has fallen to 5% of the 1960-1979 average in the Atlantic region and to less than 1% in the North Sea area, showing no sign of recovery. There has also been a continuous decline in the recruitment of young yellow eel since the 1950s.

Salmon caught with hook, Nexø, Bornholm, Denmark. March 2011. © OCEANA/ LX

Sea trout and salmon for sale, Riga, Latvia. May 2011. © OCEANA/ LX

Besides extensive overfishing, changes in environmental conditions at the spawning grounds and during the oceanic phase are likely to have affected the status of eel. Habitat alterations, including barriers to eel passage, deterioration in water quality, contaminants, non-native diseases and parasites have contributed to the mortality of eels. Another threat is the bioaccumulation of contaminants in eels, which has been a serious problem in some areas. It is even likely that there is a negative relationship between eel contaminant levels and the spawning success of eels. This problem has been highlighted mainly in relation to food consumption limits and is leading to fishery closures to protect consumers. Setting closures in this type of selective manner may lead to an increased proportion of low quality spawners in the escapement[127].

ICES advice for eel in 2012[128] reiterates its previous advice that all anthropogenic mortality, from recreational and commercial fishing, hydropower and pollution affecting production, and eels escapes should be reduced to as close to zero as possible until there is clear evidence of an increase in both recruitment and the size of the adult stock. Furthermore, ICES advises that in order to facilitate stock recovery all catches of glass eel should be used for stocking. Moreover, stocking should not be used to continue fishing and should only take place where all anthropogenic mortalities are low.

After decades without effective action to stop the decline, a management framework for the recovery of eel was established in 2007 through a European Council Regulation known as the Eel Regulation[129]. The objective of this regulation is the protection and recovery of the eel stock. To achieve the objective, Member States have developed national management plans for their river basin districts, designed to reduce anthropogenic mortalities and increase silver eel biomass. Measures in the plans include limiting fisheries; facilitating migra-

European eel in the Sound, Sweden. May 2011.
© OCEANA/ Enrique Talledo

tion through the rivers and restocking suitable inland waters with young eels. In 2012, Member States will report to the EU on the implementation of their management plans, and the effect they have had on the stock and fisheries.

In the Baltic, countries have agreed on joint measures under HELCOM and on a rapid implementation of the long-term management plans for eel no later than 2012, which includes ensuring successful eel migrations from the Baltic Sea drainage basin to natural spawning grounds. Sweden has agreed to be the lead country for these actions.

Since 2008, European eel has been listed on Annex II of the Convention on International Trade of Endangered Species (CITES) - which went into effect in March 2009. This means that glass eels cannot be exported from the EU unless such export is deemed not to be detrimental to the stock. Additionally, an EU country wishing to export glass eel outside the EU must have an approved eel management plan in place.

Since the entry into force of the listing, the species has been closely monitored by the EU Scientific Review Group (SRG). The SRG unanimously concluded that it would be impossible (for the time being), for scientific authorities in the EU to deliver a "non-detriment finding" for any export from or import into the EU of European eels. This means a *de facto* import and export ban for trade with European eel and with countries outside the EU. The ban has been prolonged until December 2012 - following a confirmation of the negative opinion of the SRG on the 7th October 2011[130].

Though any exports and imports of eel after March 2011 from countries outside the European Union and to the EU from third countries should be impossible based on CITES rules and the SRG decision, loopholes allow the trade of processed or frozen specimen with countries outside the EU harvested prior to the ban until April 2012. In fact, after March 2011, the trade of eels continued with countries outside the EU according to the EU trade statistics[131]: Denmark imported 15 tonnes of live eels and exported 100 kilos of fresh eel, 50 tonnes of frozen eels and 5 tonnes of smoked eels. Germany imported 66 tonnes and exported 200 kilos of frozen eels and exported 2 tonnes of smoked eels. Estonia exported 200 kilos of fresh eels, Lithuania exported 20 tonnes of frozen eels, Poland imported 75 tonnes of frozen eels and Sweden imported 100 kilos of fresh eel. These large amounts bring into question why trade with alive or fresh eels was still possible after March 2011 and wether the processed or frozen species were actually harvested prior to the ban.

Harbour porpoise

The harbour porpoise is a small cetacean species inhabiting temperate and cold waters throughout the northern hemisphere. In the early 1900s, the species was wide-spread throughout the Baltic Sea with approximately 10,000 individuals. Between 2002 and 2008 however, the population of Baltic Sea harbour porpoise is estimated to have stood at an average of 800 total individuals[132].

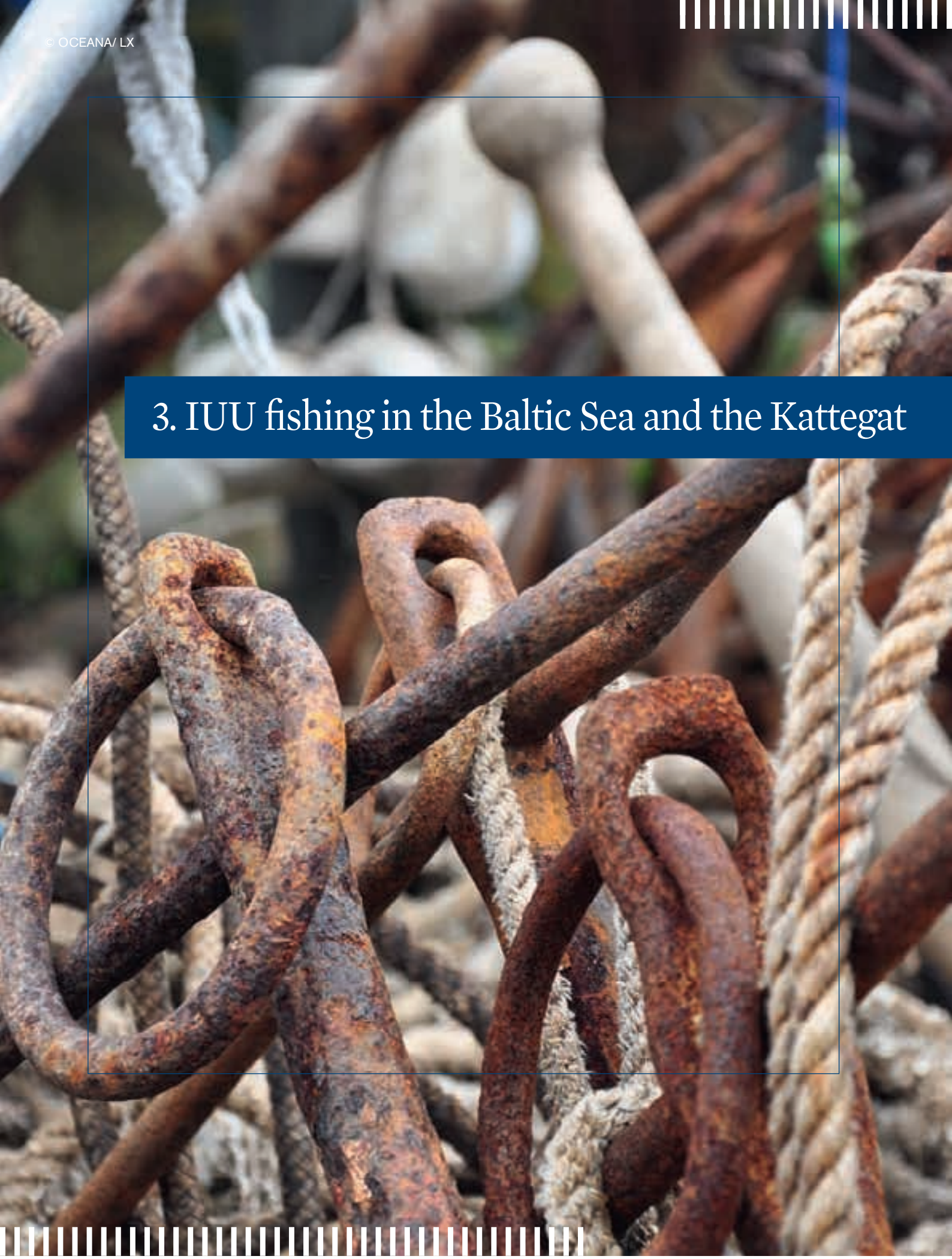
The Baltic Sea sub-population of harbour porpoises is classified as "critically endangered" under IUCN criteria and is listed both in Annex II and Annex IV of the EU Habitats Directive. It is also part of the "Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas under the Bonn Convention (ASCOBANS)". Baltic Sea states have also agreed on HELCOM Recommendation 17/2 to protect the harbour porpoise in the Baltic marine area.

Cods in the port of Nexø, Bornholm, Denmark. March 2011. © OCEANA/ LX

The collapse of the population started with intense hunting in the late 1800s, which ended in the early 1900s. Today the main threat to the Baltic Sea harbour porpoise is entanglement in fishing gear. Other major threats include hazardous substances, the destruction of habitats and underwater noise as well as increased ship traffic. ASCOBANS has estimated that due to the low abundance of porpoises in the Baltic, the current by-catch rate is much too high, and Baltic porpoises may become extinct in the near future unless actions are taken to prevent future decline[133]. German studies indicate that by-catch is a major threat to harbour porpoises in south-western Baltic Sea[134].

Sharks

Due to the conditions in the Baltic Sea, mostly low salinity levels, small size, physical barriers and others, there is a belief that neither shark, nor ray nor chimaera species have ever inhabited it, but that is not correct. These conditions do restrict and limit the occurrence of the aforementioned species, but do not preclude their existence. A recent study[135] shows that more than 30 such species have been found in the Baltic and the Skagerrak, some are even commonly found, like the spurdog (*Squalus acanthias)* and dogfish (*Scyliorhinus caniculus*). Most of the sharks in the Baltic Sea and the Kattegat are classified as threatened under IUCN criteria and are included in the HELCOM list of threatened species. Moreover, available data on shark and ray catches in the Baltic Sea show a high level of catches in the Skagerrak and the Kattegat and even in the Western Baltic Sea to some extent. The report shows that sharks, rays and chimaeras are not only present but that their populations have been and still are caught in fisheries, underscoring a need for strong conservation measures (i.e. management plans), which are currently non-existent.



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3. IUU fishing in the Baltic Sea and the Kattegat

Fisheries provide a vital source of food, employment, recreation, trade and economic well-being. IUU fishing - which stands for illegal, unregulated and unreported fishing undermines these roles. EU fisheries commissioner Maria Damanaki points out: "Pirate fishing, often called illegal, unreported and unregulated fishing, deprives an estimated half billion law-abiding fishermen and their communities up to $23 billion worth of seafood annually around the world". A study estimates the total value of current illegal and unreported fishing losses worldwide to be between $10 billion and $23,5 billion annually, representing between 11 and 26 million tonnes[136]. Even the low end of that range is equivalent to 15% of world marine catches[137].

According to the Food and Agricultural Organisation of the United Nations (FAO), IUU fishing includes three principal types of activities[138]:

1. **Illegal fishing refers to activities:**
   - conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations;
   - conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organization but operate in contravention of the conservation and management measures adopted by that organization and by which the States are bound, or relevant provisions of the applicable international law; or
   - in violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organization,
2. **Unreported fishing refers to fishing activities:**
   - which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations; or
   - undertaken in the area of competence of a relevant regional fisheries management organization which have not been reported or have been misreported, in contravention of the reporting procedures of that organization,
3. **Unregulated fishing refers to fishing activities:**
   - in the area of application of a relevant regional fisheries management organization that are conducted by vessels without nationality, or by those flying the flag of a State not party to that organization, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organization; or
   - in areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.

Catch misreporting, most commonly observed in the form of unreported or misreported landings (i.e. landing more fish than reported or not reporting certain landings at all) and area misreporting (e.g. taking fish from a certain stock during its closed season and reporting a different area) is often the result of a combination of an oversized fishing fleet with low, restrictive quotas and/or insufficient number of inspections.

The activities listed above by definition mean that catches are either misreported, or not reported at all, to the relevant public authorities. IUU fishing is thus a major contributor to overfishing[139].

The EU is the world's largest importer and exporter of fish by volume. In 2008, the EU was the third largest importer behind Japan and the United States, and the second largest exporter behind China, by value[140]. Growing demand for fish, combined with local resource depletion, has promoted a major expansion of European fleets in size and fishing range.

Fishermen often employ already tested and effective methods of circumventing regulations. The most notable of them involve[141]:

- Hiding illegal cargo in specially adapted and concealed holds on vessels;
- Hiding illegally caught fish under a layer of fish of another species;
- Reporting eastern Baltic cod as western Baltic cod;
- Evading inspection by quickly passing information to each other on the whereabouts of inspectors;
- Landing fish late at night;
- Engaging in "fish laundering" - selling traders larger quantities of fish than those declared in first-sale records;
- Putting untaxed fish on the market through illegal channels of distribution;
- Attempting to make connections and "deals" with inspection agencies.

Four major types of negative outcomes of illegal, unreported and unregulated fisheries can be described:

- **Direct economic losses:** these losses are coming from the monetary value of fish caught that could have been taken if not for IUU fishing activities. It translates into the loss of revenue from levies never paid such as landings or license fees and taxes. It results in direct losses to GNP;
- **Indirect economic losses:** these losses result from the decrease of employment and income and in fisheries (e.g. lower catches leading to loss of jobs and turnover in the sector);
- **Environmental losses:** IUU fishing is unsustainable and is posing major negative impact and threat to ecosystems and targeted species (e.g. overfishing leading to stock collapse);
- **Socio-economic losses:** IUU fishing activities can lead to reduction in productivity of fish stocks. This leads to reduced catches and other negative impacts on other, legally working fishermen.

In the EU, several regulations have been established and enforced in the past few years to tackle IUU fishing: the EU Control regulation[142]; the IUU Regulation to combat illegal, unreported and unregulated fishing[143] (which applies mainly to third-country vessels); and the Regulation on Fisheries Authorisations[144] (which deals with the control of EU vessels fishing outside EU waters and of third country vessels fishing in EU waters).

In 2004, the ICES Baltic Fisheries Assessment Working Group estimated the level of IUU fisheries to be as high as 35-40% in some Baltic fisheries[145]. Latest since then, the problem has become well known and discussed among scientists, experts and the fishing

Cods in crate in the port of Ustka, Poland. March 2011. © OCEANA/ LX

industry. As a consequence, the European Fisheries Control Agency got involved and control measures have been increased on eastern Baltic cod fisheries. Misreporting by countries is estimated to have decreased to 6% for cod in 2008 and 2009, however, the ICES Baltic Fisheries Assessment Working Group also points out major inconsistencies in reported catch data, compared to independent scientific surveys, and states that the decrease to 6% seems unrealistic[146].

In May 2010, the Fisheries Centre at the University of Bristish Columbia published: "Total marine fsheries extractions by country in the Baltic Sea: 1950-present" as a part of the worldwide "Sea Around Us" project. The report was published in order to estimate the total fisheries catches by the countries bordering the Baltic Sea (as opposed to reported landings) from 1950 to 2007 (Table 7). In addition to the reported landings, four other catch components were estimated for the nine coastal Baltic Sea countries (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden): *adjustments'* to ICES landings statistics (i.e. data source adjustments), *unreported landings'*, *'discards'*, and *recreational catches'*[147]. In that report, the overall amount of IUU fishing (adjustments and unreported landings), discards and recreational catches have been estimated to be between 12% for sprat and 54% for Baltic cod in 2007. On average, species by species, these types of catches were estimated at 33% of the real total catch.

Table 7. Estimated total catches of Baltic Sea fisheries in 2007. Source: "Total marine fisheries extractions by country in the Baltic Sea: 1950-present"[148].

Species	Reported landings to ICES 2007 (tonnes)	IUU fishing (tonnes)		Discards 2007	Recreational fisheries 2007 (tonnes)	Total (tonnes)	% IUU, discards and recreational fishing
		Adjustments to ICES statistics 2007	Unreported landings 2007				
Cod	63,480	2,964	48,628	14,950	8,714	13,8736	54%
Herring	258,195	6,714	56,864	24,854	3,508	350,135	26%
Sprat	407,017	-15,242	42,910	26,144	45	460,874	12%
Salmon	916	-32	120	425	176	1,605	43%
Flatfish	23,074	-74	2,560	12,076	1,417	39,053	41%
Other	50,573	-9,705	4,648	4,742	15,096	65,355	23%

Loading cods to a truck in the port of Ustka, Poland. March 2011. © OCEANA/ LX

In May 2011, ICES published their annual stock assessments and advice for some Baltic and Kattegat fish stocks, including updated estimations of misreporting and unallocated removals of the stocks (Table 8). Even though for some stocks the amount of IUU fishing had improved over the last years, for other stocks and areas, it was still very high. For eastern Baltic cod, the ICES working group on Baltic Fisheries Assessments clarified in 2011 that the drastic drop in cod misreporting from 2004 levels (as mentioned above) "might not reflect reality". Inconsistencies in the data for officially reported cod catches in the Kattegat with fisheries independent data forced scientists to apply a factor of corrections to the removal from the stocks, due to discards and misreporting up to 12 times the reported catch. Misreporting of salmon catches in 2010 was as high as ever and scientists estimate IUU catches that year to be up to 50% of the total catches in tonnes.

Table 8. Information on IUU fishing from ICES stock assessments[149].

Stock	% IUU/Unallocated landings	ICES 2011: Report of the Baltic Fisheries Assessment Working Group
Baltic cod West	Not given	"Removals of cod in recreational fisheries in the Baltic are substantial, but not consistently and completely sampled, and therefore not included in the assessment." "Some high-grading in Danish fisheries might take place but not indicated to be substantial."
Baltic cod East	Cannot be quantified	"…although unreporting has likely decreased in 2008-2009 due to more strict enforcement of fishing control and an overall reduction in effort, a decline to 6% from 35-40% (the estimate of previous years) in just one year might not reflect reality."
Baltic cod Kattegat	82%-92%	"The assessment has shown a discrepancy between the reported landings and total removals from the stock The model estimated total removals in 2003-2010 to be 3-8-times higher than the reported landings; this level cannot be explained by the available estimates of discards. For 2010, ICES scientists estimated that actual removals from the Baltic cod stock in the Kattegat are 5,59 to 12,26 times higher than the reported landings. Discrepancies cannot be explained with discards."
Herring, Gulf of Riga	10%	"It is expected that misreporting of catches occurs (either underreporting or over reporting), in 2010 it was estimated at the level of 10%."
Herring, Bothnian Sea	6%	"Of the total catch, 94% was re-ported with the EU fishing logbook, In the final Finnish catch estimates, the landings data is corrected accordingly."
Herring, Bothnian Bay	6%	"Of the total catch, 94% was re-ported with the EU fishing logbook, In the final Finnish catch estimates, the landings data is corrected accordingly."
Herring, subdivisions 25-29 and 32	Not given	"No quantitative information on unallocated landings was presented, It is, however, expected that misreporting of catches occurs…"
Spring spawning herring	0%	"…not believed to occur…"
Baltic sprat	Cannot be quantified	"It is expected, however, that misreporting of catches occurs, as the estimates of species composition of the clupeids catches are imprecise…"
Salmon	22%-50%	"Misreporting of catches probably occurs in all different types of fisheries, fisheries zones and countries… Reporting of salmon as sea trout or rainbow trout or even marine rainbow trout, creates an additional source of unreported salmon, Inexplicable inadequacies of basic data exist"
Sea trout	-37% of the catch in Main Basin, -24% of total catch	"The actual catch of Polish sea trout may be overestimated because due to TAC restrictions salmon is likely reported as sea trout…"

Cases of IUU fishing: Denmark and Sweden

IUU fishing in the Baltic Sea has been best documented in Poland and Denmark, the largest fishing nations for cod, and some cases have been made public in Sweden. The fact that information on IUU fishing in commercial and recreational fisheries is not publicly available from the other Baltic countries does not mean, however, that it is not happening, but rather shows the approach to transparency in these countries. In 2010, the Danish AgriFish Agency identified, in total, 104 cases of fisheries law violations in the Kattegat, the Sound, the Belt Sea and the Western and Eastern Baltic Sea (see Table 9)[150]. Twenty-nine of these cases involved cod, of which 21 were identified in the Eastern Baltic Sea, as shown in the Table 9.

Table 9. Information on IUU fishing from media reports and country information (Media, several articles 2010-2012).

Area	Date	Case
Denmark, Bornholm[151]	22.06.2011	Trawl fisherman used with illegal gear with reduced mesh sizes west of Bornholm. The fisherman was fined.
Denmark, Bornholm[152]	30.01.2009	Polish fisherman fished illegal, and was caught when he landed the fish in Nexø, Bornholm. The fisherman was fined and the catch was confiscated.
Denmark, Kattegat[153]	2010-2011	The Greenpeace case: in total 10 cases of illegal fishery in a closed area in the Kattegat were reported to the police by the Danish AgriFish Agency. Some of the fishermen were fined so far.
Denmark, Bornholm[154]	2010	In May 2010, Danish fisheries inspectors found a large Latvian trawler fishing illegally in the Bornholm Basin and brought the vessel up.
Sweden, Bothnian Bay[155]	09.02.2012	Illegal fishery in the Bothnian Bay. The Swedish Agency for Marine and Water Management charged a fisherman in Haparanda to have fished without lawful vessel permits. The man is suspected to have engaged in illegal commercial fishing.
Sweden, Simrishamn[156]	13.05.2011	An inspection found an illegal fishing net near the coast in Baskemölla. The net was around 559 meter long, far too long. It was not marked with identification information. The net was confiscated, and about 40 kg of fish were released into the sea.
Sweden, Simrishamn[157]	14.02.2012	Two inspectors boarded a trawler vessel from Halland, and discovered that the crew had caught 224 kg undersized cod. The fish were confiscated.

In August 2010, Greenpeace Denmark unveiled evidence of illegal fishing activity in the Kattegat. By attaching GPS transmitters on five vessels in the Danish port of Gilleleje in the spring of 2010, they revealed that they had all fished inside a closed cod area[158,159]. This particular area was established by Denmark and Sweden in January 2009, as a result of the collapse of cod stocks in the Kattegat and in order to protect the spawning area[160]. As the closed area is situated in both Danish and Swedish waters, the two countries' authorities cooperate on the coordination of controls and the exchange of monitoring data[161]. Unfortunately, the closures have only been enforced for vessels from Denmark and Sweden.

Greenpeace's information on four of the five vessels was corroborated by the Danish AgriFish Agency, which collects data on all vessels over 15 metres long via a satellite-based monitoring system. The fifth, which was less than 15 metres long and hence too small to be monitored by the agency, was nevertheless reported to the police.

The five vessels together made more than 70 trips into the closed area between March 25th and August, 2010[162]. As a consequence of the Greenpeace's work, in 2011, three fishermen went to court and two were fined up to €6,600 and at the same time had to repay the money they earned from selling the illegally caught fish, which for one of the fisherman amounted to about €34,000[163].

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4. Cod

4.1. Cod fisheries and management in the Baltic Sea and the Kattegat

Cod, a keystone species in the pelagic community and crucial for the functioning of the Baltic ecosystem[164], is one of the most important commercially caught fishes in the Baltic Sea. Consequently, it has long been an attractive target for IUU fishing activities. Despite a recent increase in the biomass of eastern Baltic cod, Baltic cod stocks in the Western Baltic Sea and the Kattegat are still overexploited.

The cod stock in the Kattegat is severely overfished. Reported catches have declined from more than 15,000 tonnes in the 1970s to 10,000 tonnes in the late 1990s and in 2009, reported landings were below 200 tonnes according to the ICES working group for stock assessments in the Baltic Sea. The present level of fishing mortality is uncertain due to significant unallocated removals, discards are estimated at 90% of the total removals in numbers of individuals, and levels of IUU fishing are is estimated to be very high. Officially, the stock status is unknown and ICES advises that there should be no directed fisheries, and by-catch and discards should be minimised[165]. For the Kattegat stock, the ICES advice has for years been not to have directed fisheries of this stock as the stock status is unknown[166]. This advice has been constantly ignored.

In the Baltic Sea, there are two distinct stocks of cod: eastern and western Baltic stocks. Historically these stocks have been assessed separately from each other by ICES, although they have only been managed separately since 2005. Previously, both the eastern and western stocks were managed as a single stock with a shared TAC set for them.

The eastern and western Baltic cod stocks overlap in the Arkona Basin. The degree of overlap has not been quantified, but it is likely that it has increased in recent years, as the eastern Baltic stock is currently increasing in size[167].

Western Baltic cod is fished unsustainably, above MSY, while eastern Baltic cod is harvested sustainably. The highest spawning stock biomass, up to 700,000 tonnes for eastern Baltic cod and around 60,000 tonnes for western Baltic cod, was recorded in the late 1970s and early 1980s. Both stocks declined steeply during the 1980s and early 1990s when catches were at the highest levels ever recorded.

Eastern Baltic cod was severely overfished some years ago, mainly due to a high amount of IUU fishing, but there has been an increase in size of the eastern Baltic cod stock in recent years. Besides fishing, the recruitment of the eastern Baltic cod stock is strongly driven by environmental factors. Spawning is restricted to the deep basins where the oxygen content

Polish bottom trawler Jas-39, unloading cod at 9pm in the port of Jastarnia, Poland. March 2011. © OCEANA/ LX

and salinity are still sufficiently high for eggs to survive. Due to pollution and eutrophication, several traditional spawning areas of cod have become "dead areas". The amount of water with these characteristics depends on the inflow of high-salinity water from the North Sea.

The cod population is highly dependent on sprat and herring. Cod is their main predator, while sprat and herring adults in turn feed on cod eggs and larvae. Natural mortality of the pelagic stocks of sprat and herring is likely to increase in the near future since Baltic cod stocks are rebuilding successfully.

The main fisheries for cod in the Baltic Sea use bottom trawls, but cod is also caught in gillnets and pelagic mid-water trawls. The importance of longlines in this fishery has increased in recent years.

Western cod stock (ICES subdivisions 22 to 24) fisheries are dominated by Denmark and Germany, with the rest of the catches taken by Sweden and Poland. The majority of landings are made using trawls (62%) and gillnets (38%). In recent years the landings have been oscillating between 14,000 and 24,000 tonnes, with the lowest value of the time series recorded in 2010. Estimated volume of discards in 2010 was 10% of the total catch in weight. The majority of the discards were undersized fish.

The eastern cod stock (ICES subdivisions 25 to 32) fisheries are dominated by Poland, Sweden, and Denmark, with rest of the catches taken by Latvia, Lithuania, Russia, Germany, Finland, and Estonia. The majority of landings are made using trawlers (77%) and gillnetters (23%).

Unloading cod from a gillnetter in the port of Hel, Poland. March 2011. © OCEANA/ LX

Baltic cod is mainly regulated by TACs and quotas. Because of overexploitation of cod stocks in the Baltic Sea in 2007, the European Commission's "multi-annual plan for the cod stocks in the Baltic Sea and the fisheries exploiting those stocks"[168] was established to rebuild the declining population. According to the plan, the cod fisheries in the Western and Eastern Baltic Sea are regulated by seasonal closures, from 1st to 30th of April in the Western Baltic and during the month of July and August in the Eastern Baltic, to protect the cod stock, especially the spawning aggregations. The plan further stipulates several measures for increased monitoring, control and surveillance of cod fisheries. The minimum landing size of cod in the Baltic Sea is 38 cm[169].

Following a joint initiative by Denmark and Sweden, from 1st January 2009, a small area ("the triangle") in the Sound was closed for all fisheries in February and March, months which have traditionally seen a large directed cod fishery. This led to a reduction of the cod catch in subdivision 23 by more than 50% compared to the time period from 2004-2008[170].

4.2. IUU fishing for cod in the Baltic Sea and the Kattegat

Illegal, unreported and unregulated (IUU) fishing has a long history in the Baltic Sea, depleting fish stocks and compromising management efforts and recovery measures developed to maintain sustainable levels. IUU catches pose a major threat to already highly overexploited stocks, making any attempts to produce scientific stock size assessments much more difficult.

The ICES Baltic Fisheries Assessment Working Group has estimated the level of IUU fishing for Baltic cod to be as high as 35-40% in past years[171]. Moreover, estimates of the degree of misreporting available from the national industries and control agencies indicate that total catches between 2000 and 2007 were about 32-45% higher than the reported figures[172]. In 2005, the true volume of cod catches from the eastern stock was estimated to be as much as 38% higher than the officially reported landings of around 40,000 tonnes[173]. Most of these catches are believed to have been taken from Polish waters[174].

Between 2005 and 2006, European Commission inspectors conducted evaluations of the system for the verification of declared cod catches in eight Member States, including Poland. Analyses of the collected data sets (recorded catch data from the inspected and non-inspected landings) indicated under-recordings averaging at 48.71%[175].

Since 2007, both national and European Fisheries Control Agency control activities increased, especially with regards to cod fisheries and landings in the Baltic Sea: the number of coordinated days of control activity increased from 92 to 128, and the number of inspections at sea and ashore was quadrupled (from 500 to 2063). However, the problem persists, as confirmed in 2012 by the Control Agency: "the question of assessment of the current situation remains and the under declaration of cod catches still is considered a recurrent problem"[176].

In Table 10, information from countries on national control programs for Baltic cod is summarized, although Germany, Finland and Sweden, which did not provide the information requested from ICES by June 2011, are not included. The table shows a very low degree of national control activities overall (with the exception of Denmark) and a similar level of or increase in infringements in 2010 compared to 2007 for Lithuania and Poland.

Table 10. Information on national control action programmes in the Baltic Sea[177].

Information on national control action programmes in the Baltic Sea (2007-2010)[178]
DENMARK: At sea inspections increased in 2008 and 2009 and a decreased in 2010 to levels below those in 2007. Meanwhile the number of control vessels remained the same for the entire reporting period. The number of at sea violations peaked at 19 in 2009, but was much lower during the rest of the reporting period (6, 3 and 2 in 2007, 2008 and 2010 respectively). The total number of infringements in ports was much higher with as many as 55 cases reported in 2007, a number that has since decreased to about 32 in 2009 and 2010.
ESTONIA: No control activity for 2007-2010 was reported. The reason for that is the absence of cod fisheries in Estonian waters. Estonian inspections of cod fishery in other EU waters conducted in 2009 and 2010 (with a single control vessel), did not reveal any violations.
LITHUANIA: The number of at sea inspections showed an overall increasing trend from 13 days in 2007 to 56 days in 2010 with a small decline in 2009. The number of violations increased until 2009, when it reached 40 infringements, and then declined but is still higher in 2010 than it was in 2007. Additionally a relatively high increase in inspections was observed in 2008 (when the Multi-Annual Plan for Cod was implemented) as compared to 2007.
LATVIA: With the exception of 2009, the number of at sea inspections generally decreased during this reporting period. The number of control vessels also decreased from three to zero (in 2009-2010). However, even with no vessel in action, Latvia still reported a few violations.
POLAND: Similarly to Latvia, the level of Polish sea inspections declined from 2007 to 2010, with the exception of 2009. The number of inspection vessels, which ranged between 10 and 12, was the highest among all Member States that reported their national control program data. The highest number of recorded violations (17 events) occurred in 2007 and 2010, while in 2008 and 2009 it was significantly lower (8 and 2 recorded infringements respectively). In 2010, the level of detected infringements again was as high as in 2007. Poland also showed big overall number of inspections nearing 2 inspections per day at sea.

In their 2011 stock assessments for eastern Baltic, western Baltic and Kattegat cod, the ICES Baltic Fisheries Assessment Working Group commented on the misreported and unallocated landings for all three cod stocks. Concrete numbers or percentages were not provided in all cases, but it was clarified that both still occur and that, specifically in the Kattegat, the real catches of cod through discards or IUU fishing were estimated to be 80% higher than the reported landings in tonnes. Details are given in Table 11.

Cods in a crate, Nexø port, Bornholm, Denmark. March 2011. © OCEANA/ LX

Table 11. Information on IUU fishing from stock assessments (ICES 2011)[179].

Stock	% IUU/Unallocated landings	ICES 2011. Report of the Baltic Fisheries Assessment Working Group
Baltic cod West	Not given	"Removals of cod in recreational fisheries in the Baltic are substantial, but currently not consistently and completely sampled, and therefore not included in the assessment." "Size compositions within Danish commercial landings in 2010 from fishing trips with and without observers on-board were compared. The data indicated that relatively more cod at the smallest sorting category (category 5) were landed when the observers were on-board, compared to the trips without an observer; however the difference was relatively small. This indicates that some high-grading might take place, however it is not indicated to be substantial."
Baltic cod East	Cannot be quantified	"WGBFAS considers that although unreporting has likely decreased in 2008-2009 due to more strict enforcement of fishing control and an overall reduction in effort, a decline to 6% from 35-40% (the estimate of previous years) in just one year might not reflect reality. However, WGBFAS has no additional information to quantify this. For 2010, no information of potential misreporting was available to the WG. Thus, no corrections to landings figures were applied."
Baltic cod Kattegat	Not given, actual removals from the Baltic cod stock in the Kattegat are 5,59 to 12,26 times higher than the reported landings. 82%-92%	"The assessment has shown a discrepancy between the reported landings and total removals from the stock and ICES assumed that the majority of the unallocated mortality was caused by discard, but other factors such as migration, non-reported landings and re-allocation of catches also could be part of the problem."[180] The reported landings of cod in the Kattegat in 2010 were 155 tonnes, while the TAC was 379 tonnes. "In recent years, reported landings appeared not to represent total removals from the stock; significant bias was estimated for 2003-2010. The model estimated total removals in 2003-2010 to be 3-8 times higher than the reported landings; this level cannot be explained by the available estimates of discards. Unallocated removals were estimated separately for the years 2003-2010, but common for all age-groups within a year. Scaling factors estimated for 2003-2010 were significant for all the years. For 2010, ICES scientists estimated that actual removals from the Baltic cod stock in the Kattegat are 5.59 to 12.26 times higher than the reported landings. Discrepancies cannot be explained with discards."[181]

Poland

Poland had a large problem with IUU fishing of cod until 2007, when national and European controls were increased and fisheries rules became better enforced. However, a review of local news stories showed that IUU fishing of cod is still happening in Poland (Table 12).

Polish scientists have been more sceptical than ICES in their estimates[182], assuming illegal catches to be more than 100% higher (at the stock level) than the actual quota.

In 2006, Grzegorz Hałubek, President of the Polish Fishermen's Association openly admitted to one of the Polish biggest daily newspapers[183] that: "In Poland all fishermen exceed the quota, because if they fished only what they are allowed to do they would have starved to death". A year later, Polish fisheries became infamous, when "the big cod fraud" case of fishermen exceeding quotas, made headlines in the local media.

Table 12. Information on IUU fishing from media reports and country information (2011, 2012).

Area	Date	Case
Poland[184]	26.01.2012	Two tons of illegal caught cod hidden in a secret cache.
Poland,[185] Jeziorzany	03.12.2011	Two poachers caught for illegal fishing. Residents of the Jeziorzany municipality caught fish with nets in the river.
Poland, Słupsk[186,187]	21.07.2011	Polish fisheries inspectors and coast guard in Słupsk found half-a-tonne of illegally caught cod on a vessel from Kołobrzeg (Koł-180), according to Głos Pomorza newspaper in Słupsk.

Outlook: Polish cod fleet returns to fishing in 2012

Between 2009 and 2011, new rules in Polish cod fisheries were introduced[188]. The previous requirement to inspect 20% of cod landings was raised to 100% - all cod retained on-board of fishing vessels had to be reported to inspectors. Furthermore, in order to address the issues facing cod fisheries, Poland implemented a system called 'Trójpolówka'. The key principle was that only 1/3 of the fleet would go out to sea to fish for cod while the rest stayed in port and received compensation in the form of subsidies (though they still could fish other species). Vessels were selected on a random basis in a lottery each year. While this system was in place (between 2009 and 2011) the Polish cod quota had also been reduced as a penalty from the European Council for previously exceeding catches[189].

However, since 2012, Poland has not had sufficient funds to continue the compensation scheme, and has thus ended the 'Trójpolówka' system, allowing for the entire cod fleet to resume normal activities. At the same time, while the cod quota for 2012 increased by 15%, the amount of cod fishing vessels increased by 200%, thereby reducing individual vessel quotas by 50% of what they were in 2011. This caused a lot of controversy between fishermen and the government. Angry fishermen took the streets[190] to show their disapproval. The government has stood firm against initial protests, but fishermen are now filing lawsuits on the basis of the Polish constitution which "forbids limiting economic activities by means other than official regulations", claiming that the government is trying to reduce their profits illegally.

Oceana findings: Cod fisheries

Cod management plan and closed seasons

The long-term cod management plan, introduced after stocks had been dramatically reduced, includes closed seasons. In the Western Baltic Sea and the Belt Sea, the fishing season closes during the month of April, and in the Eastern Baltic, it closes in July and August[191].

Despite these measures, aimed at protecting cod stocks and spawning aggregations, considerable amounts of cod were landed and traded in Denmark and Sweden during the closed season. In April 2011, for example, Danish fishing vessels landed 151 tonnes of cod, caught in the Western Baltic Sea[192], while Swedish vessels from Eastern Baltic ports landed seven tonnes in August 2011[193].

In Polish fishing ports, cod was offered to clients and restaurants and sold directly from the ships throughout July and August, as shown in the photographs below.

The cod management plan's many loopholes make controls extremely difficult and create legal situations wherein fishing for and landing cod during "closed seasons" is permissible, undermining the very point of the plan's conservation efforts.

Cod and flatfish for sale directly from the boat, in the port of Darlowo, Poland. July 2011. © OCEANA/ Marek Budniak

Cods for sale in the port of Darłowo, directly from the boat. Poland. July 2011. © OCEANA/ Marek Budniak

In Poland, Oceana observed cod being sold directly from fishing vessels to customers and restaurants. This practice, especially during the closed season, makes it difficult to control the amount of fish a vessel is unloading.

Polish fishing vessel, selling cod directly to consumers in July 2011 (closed season) in the port of Łeba, Poland. The vessel entered the EU fleet register with 12.08 metres length and was in 2006 modernized to 11.98 metres length. Vessels smaller than 12 metres are allowed to fish cod in the closed season during some days. © OCEANA/ Marek Budniak

Cod has a minimum landing size of 38 cm in the Baltic Sea and the catching, landing and selling of undersized cod is a frequent problem in EU harbours. The overfishing of juvenile fish, which have yet to reach maturity and reproduce, can lead to the overexploitation of the entire stock.

Crate with cod of different sizes, Orłowo, Poland. April 2011. © OCEANA/ LX

Crate with cod of different sizes, Dziwnów, Poland. April 2011. © OCEANA/ LX

© OCEANA/ LX

5. Salmon and sea trout

5.1. Salmon and sea trout fisheries and management in the Baltic Sea and the Kattegat

Some positive developments have been noted[194,195] in salmon stocks. These include an increase in the number of juveniles entering the sea (total smolt[196] production), although this has now levelled off, particularly in the northern Baltic Sea. Nevertheless, a large part of salmon stocks remain in a critical state.

Salmon is listed as threatened and declining by HELCOM[197]. Salmon in freshwater (with the exception of those in Finland) is listed as a species of European importance in the Habitats Directive[198] and EU Member States are obliged to designate special areas of conservation (SACs) in order for the species to be restored and maintained at a favourable conservation status. The latest reporting round on the implementation of the Habitats Directive showed that salmon has an unfavourable conservation status across the bioregions in the Baltic Sea catchment area.

Baltic salmon populations reproduce in at least 43 river systems, of which at least 29 host an original salmon population or one that is partly mixed with other populations following stocking practices[199]. There are wild salmon rivers in all sub-basins of the Baltic Sea including the Kattegat. Many bigger rivers have shown an increased production of smolts and of ascending spawners. Unfortunately this positive trend has not been observed in many small salmon rivers[200], of which many have also lost their original wild salmon populations. The main reasons for the loss have been the damming of rivers for hydropower and the dredging of rapids and riffles for log driving purposes.

The Baltic Sea contains approximately 1,000 sea trout populations of which about 500 reproduce naturally in Baltic rivers[201]. The status of these populations varies greatly across different regions[202]. ICES assessments show that the stock status is poorest in eastern (ICES subdivisions 26 and 28) and northern (ICES subdivisions 29-32) areas of the Baltic Sea. In the Gulf of Bothnia, sea trout populations are endangered[203] and in the Gulf of Finland they are in an unsatisfactory state. This is due to excessive fishing pressure, obstacles to migration and habitat degradation[204]. In the main basin of the Baltic Sea, stocks are generally in a better state, but are also threatened by migration barriers and habitat destruction[205].

Salmon, caught in floating nets in the mouth of the Vistula river, Świbno, Poland. April 2011. © OCEANA/ LX

Fishing and management

The Baltic Sea commercial salmon quota is divided into two parts: the main basin and the Gulf of Bothniaquota and the Gulf of Finland quota. Not included in quota calculations, are recreational catches from the sea, estuaries and rivers, despite the fact that recreational fishing accounts for approximately one quarter of the total amount of salmon caught in the Baltic Sea region and nearly one half of the catch taken from the shore or rivers.

Salmon catches have decreased from 5,633 tonnes in 1990 to 886 tonnes in 2010[206]. The decrease has been particularly marked in offshore fisheries, and the proportion of catch taken in coastal and recreational river fisheries has actually increased. This has mainly been due to fishing pressure in offshore waters stemming from the EU regulation prohibiting driftnets. Since then, fishing in the Baltic main basin for mixed salmon stock declined significantly. In fact, longline fisheries have increased substantially since 2008 and ICES[207] has indicated that the current offshore harvest rate is almost as high as the combined harvest rate for longlines and driftnets in the mid-2000s. Since the ban, former driftnet fishermen have also started to use semi-drifting, anchored nets instead (see page 54). Currently, the stock is unlikely to reach a 50% survival target for one or two year old salmon in half of the 27 rivers assessed by ICES. Only the stock in eight of the rivers is likely or very likely to reach 50% of the survival rate in the short term. For six rivers the situation is uncertain.

Salmon in in the Gulf of Finland: ICES advises that there should be no fishing of Estonian and Russian wild salmon in the Gulf of Finland[208]. A reduction in exploitation in the Main Basin needs to be considered as salmon from the Gulf of Finland utilize it as a feeding area.

Salmon in the Main Basin and Gulf of Bothnia: based on the MSY approach, ICES advised a TAC of 54,000 salmon for 2012[209].

Despite ICES' aforementioned TAC recommendation, the Council of Ministers disregarded the advice, much like they have in previous years, setting a TAC more than twice as high at 122,000 salmon. If IUU catches remain at the same level as estimated in 2011, this means that the 2012 quota will be exceeded by an additional several tens of thousands of salmon.

The Swedish board of fisheries has decided to phase out salmon fisheries in the Baltic main basin in 2012[210].

In 2011, the European Commission proposed establishing a multiannual plan for the Baltic salmon stock and the fisheries exploiting that stock[211]. This proposed management plan applies to commercial fishing both in the Baltic Sea and to the rivers flowing into it. The proposal's main aim is to ensure that the salmon stock is exploited in a sustainable way, in line with the principle of MSY, and that its genetic integrity and diversity are safeguarded. The plan has not yet been adopted.

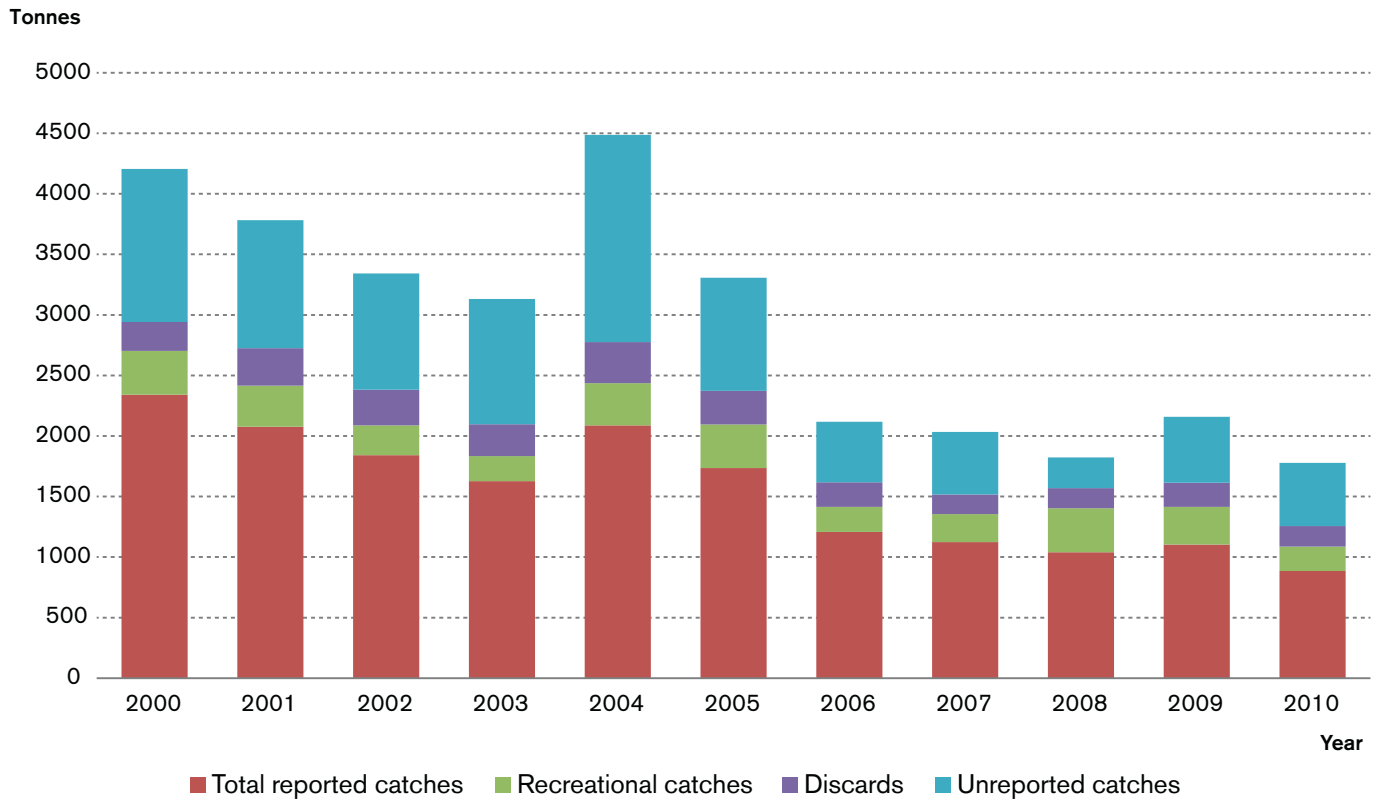
Sea trout, on the other hand, is mainly fished in coastal areas and rivers and only to a minor extent in offshore waters. It is the target of both commercial and recreational fisheries. The overall trend of catches has been decreasing since the 1990s from 1,563 tonnes in 1990 to 756 tonnes in 2009. The largest proportion of the total catch is taken from the Baltic Proper, while the Gulf of Bothnia and Gulf of Finland are other important catch areas[212].

5.2. IUU fishing for salmon and sea trout in the Baltic Sea and the Kattegat

The proportion of mature salmon individuals returning to their natal rivers to reproduce has been at low levels in recent years[213]. This is suspected to be due to high levels of IUU fishing for salmon and the misreporting of salmon as sea trout in some fisheries. IUU fishing for Baltic salmon has been a well-known and widely discussed problem for decades. The ICES working group on Baltic salmon and sea trout estimates unreported landings to be between 355 and 1,700 tonnes per year since 1985.

Figure 7 shows ICES estimates for the real amount of salmon catches per year since 2000. Total reported catches only represent around 50% of the total catch and unreported catches represent around 30% of total catches.

Figure 7: ICES estimates for the real amount of salmon catches per year (ICES 2011)[214].



Åland Islands fishing vessel Verona, former driftnetter, unloading salmon in Nexø port, Bornholm. Denmark. March 2011. © OCEANA/ LX

Misreporting salmon as sea trout

In its advice on fishing opportunities for 2012, ICES identifies widespread misreporting of salmon catches as sea trout in longline fishing in the Baltic Sea. The latest ICES information shows the magnitude of the misreporting by presenting estimates of additional Polish catches (Tables 13 and 14). In 2010, an estimated additional 70,511 salmon went unreported or were misreported as sea trout. The catch per unit effort in the Polish offshore fishery indicates large scale misreporting of salmon as sea trout, which constitutes 22% of the ICES estimated total salmon catch[216].

Table 13. Information on IUU fishing from stock assessments (ICES 2011)[215].

Stock	% IUU/Unallocated landings	ICES 2011. Report of the Baltic Fisheries Assessment Working Group
Salmon	22%-50%	"Misreporting of catches probably occurs in all different types of fisheries, fisheries zones and countries… Reporting of salmon as sea trout or rainbow trout or even marine rainbow trout, creates an additional source of unreported salmon. Inexplicable inadequacies of basic data exist: i.e. significant differences of tagged fish recapture compared to total catch of salmon by country, significant differences in catch composition in the same fisheries by different countries (proportion of sea trout and salmon in the same fisheries and subdivision)."
Sea trout	-37% of the catch in Main Basin, -24% of total catch	"The actual catch of Polish sea trout may be overestimated because due to TAC restrictions salmon is likely reported as sea trout."

Table 14. Total salmon catches in the Main Basin and Gulf of Bothnia (ICES subdivisions 22-31), discard estimates, additional Polish catches estimates, total unreported catches estimates, and total catches estimates between 2005 and 2010[217].

Year	Reported total	Discard estimation	Estimated additional Polish catches	Total unreported catches, estimation	Total catches, estimation
2005	340,855	54,040	111,396	184,746	605,080
2006	227,468	37,278	45,533	94,388	376,817
2007	217,193	32,024	53,793	101,024	367,467
2008	198,103	32,118	2,282	47,629	292,199
2009	219,270	40,985	63,988	108,818	389,286
2010	167,923	32,837	70,511	107,454	320,015

Oceana findings: salmon and seatrout fisheries

The use of driftnets and "semi-driftnets" in the Baltic Sea

Salmon and sea trout in the Baltic Sea have been caught during the last decades through the use of gillnets, mainly driftnets and set (anchored) gillnets. Gillnets are defined by FAO, as strings of walls vertical, near by the surface, mid-water or on the bottom, on which the fish will gill, entangle, or enmesh. They have a characteristic float line in the upper rope, and weights in the ground line or footrope.

Driftnets are defined by the EU law[218] **as: "**any gillnet held on the sea surface or at a certain distance below it by floating devices, drifting with the current, either independently or with the boat to which it may be attached. It may be equipped with devices aiming to stabilize the net or to limit its drift". Those nets have been used in Baltic offshore fisheries for salmon and sea trout as driftnets, attached to a boat only at one side and left free to drift with the current. Due to the fact that those nets have a lot of by-catch of unwanted fish, marine mammals and seabirds, driftnets longer than 2.5 kilometres have been banned by the United Nations General Assembly since 1992, in EU waters and for EU vessels since 2002[219] and are banned in the Baltic Sea since January 2008[220].

The use of driftnets and "semi-driftnets" in the Baltic Sea

Another type of floating gillnet, with a similar by-catch problem, which in the Baltic Sea includes catches of harbour porpoises and seabirds, is the floating gillnet, which is attached to the sea bottom, typically with an anchor and used in fisheries for salmon and sea trout. These nets, though previously treated legally as driftnets, and originally bound to the same rules as driftnets before the ban, have been exempt from the driftnet ban in the Baltic and have been defined by the European Commission as "set gillnets (anchored)" since 2006. They are also called "semi-driftnets" and are used in Polish and Finnish coastal fisheries[221].

Drifting nets for salmon and sea trout in the Vistula River

In the summer of 2011, Oceana documented a number of fishermen from the port of Świbno, in the mouth of the Vistula River, just a few metres from the open Baltic Sea, using driftnets to fish salmon and sea trout. Five hundred meter-long nets, long enough to cover the width of the river, were attached to one boat and left to drift for two hours towards the open sea before being retrieved at the mouth of the river. Five boats form a team and as soon as one net is retrieved, the next net is set[222]. Before the driftnet ban came into effect in January 2008, Świbno was one of the ports where Polish driftnetters were based[223].

Retrieving the net. Artisanal fishermen, fishing salmon and sea trout in the mouth of the Vistula river with a floating net, Świbno, Poland. April 2011. © OCEANA/ LX

Floating net, Świbno, Poland. April 2011. © OCEANA/ LX

Artisanal fishermen, fishing salmon and sea trout in the mouth of the Vistula river with a floating net, Świbno, Poland. April 2011. © OCEANA/ LX

Salmon, caught in a floating net. Świbno, Poland. April 2011. © OCEANA/ LX

Baltic fishing vessels, registered as driftnetters in 2012

Even though "driftnets" are banned in the Baltic Sea, the Belt Seas and the Sound, some 10 to 32 meter long vessels from Latvia, Lithuania and Finland are still officially registered as driftnetters in the EU fleet register[224]. Three Latvian fishing vessels >24 metres are actively fishing in the Baltic Sea, holding a license for cod in 2012, two of them are owned by the Latvian company Lat-Salmon Ltd.[225]. Table 15 lists information about vessels registered as driftnetters.

Table 15. Information about driftnetters from the European Fleet register (EU fleet register 2012).

Country code	Vessel name	Port name	Call sign	Gear main code	Gear sec code	Length overall	Remarks
LVA	SĒME	RIGA	YL2018	GNS	GND	31,85	Holds a Latvian license for cod fishing in the Baltic 2012[226], Owner: Rabusko[227]
LVA	LAIMDOTA	LIEPAJA	YLJT	GNS	GND	26,5	Holds a Latvian license for cod fishing in the Baltic 2012, Owner: Lat-Salmon Ltd
LVA	DZINTARI	LIEPAJA	YLJU	GNS	GND	26,5	Holds a Latvian license for cod fishing in the Baltic 2012, Owner: Lat-Salmon Ltd
FIN	M/S MERILINTU	UUSIMAA	OF2605	LLD	GND	14,6	Registered as a driftnetter since 1995, changed registry to set-gillnets in January 2008 and back to driftnets in January 2010[228].
FIN	DELFIN	TURKU	OF2619	GND	GNS	10,97	Registered as a driftnetter since 1995, changed registry to set-gillnets in January 2008 and back to driftnets in January 2011[229].
LTU	KOPGALIS	KLAIPEDA	LYBB	GNS	GND	14,6	Inactive

Gear code: GNS/ set gillnet (anchored), **GND/** drift nets, **LLD/** drifting longline.


Latvian fishing vessels, Laimdota and Dzintari, registered with driftnets fishing gear in the port of Liepaja, Latvia. May 2011. © OCEANA/ LX

In addition to the vessels of 10 metres or more in length described in the table above, several hundred shorter Danish vessels are still registered as driftnetters in the European fleet register. Most are currently in small ports in the Belt Seas and the Sound[230]. These vessels use small meshed nets and do not target salmon and sea trout specifically.

Semi-driftnetters

In January 2005, Finland had 81 registered salmon driftnetters of more than 10 metres in length, most of which were in the harbours of Turku, Uusimaa and the Aland Islands[231]. Today, some of the driftnetters have either been retired or exported but most of the fleet changed their gear in the EU register on January 1st 2008 from driftnets to "set gillnets (anchored)". Before 2008, when the driftnet ban was enforced, one of the centres for offshore driftnetters targeting salmon was the Aland Islands, an autonomous region in Finland, where today a number of the so called "semi-driftnetters" are still active[232].

Environmental organisations and the Swedish board of fisheries have requested a change in the definition of driftnets in the EU regulation, to include "semi-driftnets" into the driftnet ban:

The former Swedish Board of Fisheries*: "It is crucial to keep the present article 9 regarding the prohibition to fish with driftnets and it should be ensured that similar gears which are fixed to the bottom with the use of anchors will not be permitted to use. Therefore it might be necessary to review the definition for driftnets or to develop a specific definition for the types of similar gears which could be a threat for the recovery of weak salmon populations in the southern part of the Baltic Sea".*[233]

Fishing vessel registered as a driftnetter until the driftnet ban came in force, than changed registration to set gillnets (anchored), Åland Islands, Finland. May 2011. © OCEANA/ Carlos Suárez

Fishing vessel registered as a driftnetter until the driftnet ban came in force, than changed registration to set gillnets (anchored), Åland Islands, Finland. May 2011. © OCEANA/ Carlos Suárez

Åland Islands fishing vessel Verona, former driftnetter, unloading salmon in Nexø port, Bornholm, Denmark. March 2011. © OCEANA/ LX

Åland Islands fishing vessel Verona, former driftnetter, unloading salmon in Nexø port, Bornholm, Denmark. March 2011. © OCEANA/ LX

Åland Islands fishing vessels in the port of Nexø, Bornholm. March 2011. © OCEANA/ LX

A fleet of former driftnetting vessels, registered since January 2008, with set gillnets (anchored), similar to the vessels, based in the Finnish Aland Islands shown above is operating from the harbours of Jastarnia and Hel in the Hel Peninsula, which separates the Puck Bay from the Baltic Sea.

Former driftnetter, changed registration to bottom trawls in January 2008, when the driftnet ban was enforced in the port of Jastarnia, Poland. March 2011. © OCEANA/ LX

Former driftnetter, changed registration to bottom trawls in January 2008, when the driftnet ban was enforced in the port of Jastarnia, Poland. March 2011. © OCEANA/ LX

Former driftnetter, changed registration to bottom trawls in January 2008, when the driftnet ban was enforced in the port of Jastarnia, Poland. March 2011. © OCEANA/ LX

Former driftnetter, changed registration to bottom trawls in January 2008, when the driftnet ban was enforced in the port of Jastarnia, Poland. March 2011. © OCEANA/ LX

Unloaded sprats in the port of Hel, Poland. In Poland, sprats are processed and appreciated as canned food. In Poland, sprats are not processed into fishmeal or animal food. March 2011. © OCEANA/ LX

6. Herring and sprat

6.1. Herring and sprat fisheries and management in the Baltic Sea and the Kattegat

There are several stocks of herring in the Baltic Sea. The spring spawning Rügen herring spawns in the western part of the Baltic Sea, near the German island of Rügen, before migrating to the Skagerrak and the northern part of the North Sea in search of food. There, they are mixed with the North Sea herring (which spawn in the autumn), and both are heavily fished. Before returning to Rügen in spring, Rügen herring spend the winter in the Sound and the Great Belt[234,235,236]. The herring in the inner Baltic Sea is generally smaller than other herrings (20-25 cm long), and reach sexual maturity at 2-3 years old[237].

Herring stocks in the Baltic Sea and the western Baltic spring spawning herring are fished both above MSY, unsustainably in relation to the precautionary approach. The state of the stock in the Bothnian Bay is unknown and only the stock in the Bothnian Sea is fished appropriately relative to MSY. Autumn-spawning Baltic herring populations have decreased since the 1960s, when they used to be abundant. Especially in the Baltic Proper, the Gulf of Finland, and the Gulf of Riga the condition of the herring has worsened since the 1980s.

Herring stocks in the Baltic are managed by four TACs that were largely set according to scientific advice for 2012:

- Baltic Sea subdivisions 30-31 (Gulf of Bothnia)
- Baltic Sea subdivisions 22-24 (Western Baltic)
- Baltic Sea subdivisions 25-27, 28.2, 29, 32 (Eastern Baltic Sea except Gulf of Bothnia)
- Baltic Sea subdivision 28-1 (Gulf of Riga)

Herring is mainly fished by mid-water trawlers in the Baltic Sea and particularly in the Baltic Proper[238], but it is also frequently caught by bottom trawlers. In coastal areas herring is caught using other methods, namely trapnets, poundnets, and gillnets. Finnish fisheries target adult herrings with bottom trawlers and use pelagic trawling to catch the younger part of the stock.

Since the 1980s herring landings in the Main Bain and subdivisions 22-29, and 32 had decreased from around 400,000 tonnes to 126,155 tonnes in 2008, which was actually an 8% increase from 2007. In the central Baltic the amount of landings is uncertain, as herring is mostly caught in mixed fisheries together with sprat[239].

In contrast, herring populations in the Gulf of Bothnia have increased in size since the 1980s from slightly more than 20,000 tonnes to around 70,000 tonnes at the end of the last decade. According to ICES, the herring catch in subdivisions 22-24 has on average made up 53,6% of the total stock of spring spawners between 2000 and 2008[240].

The minimum landing size for herring is 20 cm in the North Sea and 18 cm in the Skagerrak and the Kattegat, but none exists for herring in the Baltic Sea[241].

Unloading of sprats from Danish trawler for animal food production in the port of Nexø, Bornholm, Denmark. March 2011. © OCEANA/ LX

Sprat in the Baltic Sea and the Kattegat

Sprat (*Sprattus sprattus balticus*) is one of the most important commercial fish species in the Baltic Sea. It spawns between March and August in the open waters of the Baltic Sea, but not in the Gulf of Bothnia, due to the low salinity. Sprat is seldom found in the Bothnian Sea and Bay[242,243].

Distribution of sprat in the Baltic Sea and its biomass is strongly dependent on the cod stock through predator-prey interactions.

Sprat fisheries

In the Kattegat the stock status is unknown[244], but in the Baltic Sea the stock is fished unsustainably above MSY[245] levels. Sprat is managed with TACs and fished by pelagic mid-water trawlers, though bottom trawlers account for a considerable amount of the catch.

In the 1980s, when the cod stock was high in the Baltic Sea, the biomass of sprat was low[246]. However, sprat landings in the entire sea (subdivision 22-32) have increased considerably from less than 100,000 tonnes at the beginning of the 1980s, to 360,000 tonnes in 2011[247]. Sprat is used partly for human consumption, but almost all landings are used for industrial purposes (see page 62)[248,249].

6.2. IUU fishing for herring and sprat in the Baltic Sea and the Kattegat

The ICES Baltic Fisheries Assessment Working Group pointed out that misreporting of herring as sprat and vice versa occurs, as most of the pelagic fisheries take in a mixture of herring and sprat which causes uncertainties in catch levels (Table 16). The extent to which misreporting has occurred is not well known, however. Misreporting of between 6% and 10% of herring is assumed in the Gulf of Bothnia and Gulf or Riga stocks.

According to the ICES assessment[251] there is no concrete percentage given regarding unallocated sprat catches in the Baltic Sea.

Unloaded herring from a midwater trawler in the port of Kołobrzeg, Poland. April 2011. © OCEANA/ LX

Table 16. Information on IUU fishing of herring and sprat from stock assessments (ICES 2011)[250].

Stock	% IUU/Unallocated landings	ICES 2011. Report of the Baltic Fisheries Assessment Working Group
Herring, Gulf of Riga	10%	"It is expected that misreporting of catches occurs (either underreporting or over reporting). According to the information (interviews) about the level of misreporting in the commercial fishery, it was stated that the level of misreporting has decreased in comparison with previous years and in 2010 it was estimated at the level of 10%."
Herring, Bothnian Sea	6%	"Of the total catch, 94% was re-ported with the EU fishing logbook. In the final Finnish catch estimates, the landings data is corrected accordingly."
Herring, Bothnian Bay	6%	"Of the total catch, 94% was re-ported with the EU fishing logbook. In the final Finnish catch estimates, the landings data is corrected accordingly.
Herring, subdivisions 25, 29 and 32	Not given	"No quantitative information on unallocated landings was presented. It is, however, expected that misreporting of catches occurs…. It has not been possible to estimate the amount of misreporting by species."
Spring spawning Herring	0%	"From 2009 and on this pattern of misreporting of catches into Division IIIa is not believed to occur, based on information from both the industry and VMS estimates."
Baltic sprat	?	"No information on unallocated catches was presented to the group. It is expected, however, that misreporting of catches occurs, as the estimates of species composition of the clupeids catches are imprecise…."

Herring and sprat fishing for fishmeal and animal food

While fishermen in Denmark on average make €437 per tonne of herring meant for human consumption, they only made €194 per tonne when it was going towards industrial uses in 2010. In Germany, Baltic herring is a highly appreciated specialty, and in Lithuania it is regarded as a national heritage food. In Denmark, one tonne of sprat for human consumption brings in €280 and €197 for industrial uses like animal food or fishmeal[252]. Sweden transforms 50% of herring and 75% of sprat landed in their ports into animal food or fishmeal; Finland transforms 70% of herring and 100% of sprat landings and Lithuania uses herring and sprat only for fishmeal. Denmark, which transforms 30% of herring and 100% of sprat landings, is the largest producer of fishmeal, while in Poland no fish is used to produce fish meal[253].

Besides the economic disadvantages of much lower landing values for fish that can also be sold for direct human consumption, and the complete or net loss of protein for human food[254], mid-water trawl fisheries for fishmeal in the Baltic Sea are also inherently unsustainable because the net mesh sizes used to catch herring and sprat are very small. As a result, there are by-catches of juveniles and of non-target species, particularly of cod.

Fish for industrial uses is transformed, in most cases, as a compound food ingredient for feeding other animals. Herring and sprat from countries around the Baltic Sea is used as animal food in highly controversial Scandinavian and Russian mink farms - a use that reflects a complete loss of the resource as a source of food and protein for human consumption.

The Danish animal food factory Fish Pro, producing mink food for fur farms from Baltic sprat, in Nexø harbor, Bornholm, Denmark. March 2011. © OCEANA/ LX

Bornholm mink feed central in the port of Nexø, Bornholm, Denmark. March 2011. © OCEANA/ LX

Fish Pro Denmark - a mink fodder factory which is mainly owned by Danish mink farmers - manufactures mainly mink food from industrial fishing and some products for the consumer market, particularly barrels of spiced sprat for Estonia and Finland. They produce more than 30,000 tonnes annually. The company also imports a considerable amount of frozen fish from Poland and the Baltic states in order to obtain the necessary quantities of raw materials and thus meet the mink farm's needs[255].

Besides the fact that fish as a food and protein source for human consumption is entirely lost, mink farms for the production of furs in Scandinavia are highly controversial and have been blamed by animal rights groups since years for holding minks under extremely cruel conditions[256].

Danish midwater trawler Mickentho unloading sprat for mink food production at the Fish Pro Fish factory in Bornholm, Denmark. March 2011. © OCEANA/ LX

Bycatch of cod from a trawler, unloading sprat for animal food production in the port of Nexø, March 2011. © OCEANA/ LX

The Swedish midwater trawler Sette Mari fishing in the Bothnian Sea. Sette Mari can catch up to 350 tons of herring in one trip. They land between 20% and 30% for human consumption, the rest as forage fish or for fishmeal that is going to Norwegian salmon farms and Russian mink farms. April 2011[257]. © OCEANA/ Carlos Suárez

German recreational fishing vessel, Karoline, fishing south of Fehmarn, Germany. May 2011 . © OCEANA/ Carlos Suárez

7. Recreational fisheries

7.1. Unreported recreational fisheries in the Baltic Sea and the Kattegat

Recreational fisheries from the shore, from fishing boats, from offshore recreational fishing boats and with different kinds of nets are widespread in the Baltic Sea. Recent studies show that the quantity of fish caught by recreational fishermen has previously been underestimated and give a more realistic view of the real amount.

There is no data available on the true volume of fish caught by anglers, who are not obliged to report any catches in the Baltic area. In principle, angling from fishing boats, a practice called "trolling" in commercial fisheries is a highly selective and sustainable fishing practice and it should certainly be a technique for commercial fishing vessels to consider when phasing out destructive methods like bottom trawling for cod. Fishing with small artisanal nets is also in principle an environmentally friendly and sustainable fishing method. However, the fact that recreational fisheries are largely unregulated and catches are largely unreported poses a big problem for fisheries management in the Baltic Sea.

When it comes to sport and recreational fishing in Poland, in addition to the lack of an obligation to report catches, one of the main problems is the insufficient number of inspections. According to the calculations of some fishermen, recreational catches of Baltic cod may exceed 10,000 tonnes[258]. In 2006, the National Marine Fisheries Research Institute estimated the figure at between 4,000 and 7,000 tonnes for the entire Baltic Sea[259].

One of the widely recognised problems with recreational fisheries in Poland is the fact that anglers catch undersized fish. But Poland is the only Member State that limits recreational fishing for cod in the Baltic Sea - anglers can fish up to 7 individuals per day. This encourages foreign fishing trips, mainly to Denmark in order to fish for cod, as there are no bag limits in force. It is not unheard of for Polish anglers to then sell the fish they catch at the market, which is illegal under Polish legislation[260].

Recreational fisheries also have very high catches in Denmark and Germany. The Danish AgriFish Agency launched a control program to evaluate the state of recreational fisheries when it comes to IUU activities. The conclusion was that even though it is illegal for recreational fishermen to sell fish caught when angling, it still ends up on the market. Another problem Denmark is facing is the practice of unlicensed fisheries. Approximately 300,000 people engage in recreational fishing activities in Denmark per year. Based on data collected from anonymous interviews, it was estimated that between 23% and 28% of all Danish angler and passive gear fishermen fished without license, though with lower effort levels than fishermen with an annual license[261].

According to a German study, 113,000 to 147,000 people fish cod along the German Baltic coast for a combined total of 880,000 to 1,500,000 angling days annually. Depending on the angling method and year, two to five million cod are caught in recreational fisheries annually, which translates into 1,900 to 5,200 tonnes a year. This represents roughly 50% of the commercial German catch of cod from the same area[262]. These estimates are made without taking any illegal activities into account.

A recent Danish study on recreational fishing for eel, sea trout and cod in the Baltic Sea found that the percentage of cod catches is extremely high in the Sound and the Kattegat. Recreational fishing in 2010 accounted

for 41% of the total Danish Western Baltic Sound cod yield and angling alone for 37%. The angling catch may be even higher, since the numbers reported were converted into weight by assuming an average mass of 1500 g. The average weight of cod caught and kept by anglers in the Sound is likely a little higher, at least during the winter when spawning fish are targeted and fish larger than 10 kg are caught regularly[263]. In the Kattegat, 36% of total reported cod catches come from recreational fishermen.

In Denmark, 20% of the total eel catch and a suggested 90% of the sea trout catch comes from Danish recreational fishermen. Recreational fishing also accounts for approximately a quarter of the total salmon caught in the Baltic Sea region and nearly one half of the catch taken from the shore or rivers. These catches are not included in fishing quota calculations.

Trolling by recreational fishing vessels, mostly for cod, is becoming more and more popular in the Baltic, especially on spawning aggregations in the Danish and German waters of the Belt Sea. This type of recreational fishing, often from fishing vessels that are more than 24 metres long, is also allowed in areas that are closed to protect cod and during the month of April, when the entire Western Baltic is closed to protect cod spawning aggregations.

7.2. Poaching

In 2010, the Danish AgriFish Agency identified 305 cases of fishing rule violations in recreational fisheries. More than half of the cases involved gillnets (162 cases), and 112 cases involved traps. The locations with most cases in 2010 were Bornholm (34 cases), Isefjorden (29), Roskilde fjord (27), Smålandsfarvandet (in the Belt Sea) (23), the Sound (20), Læsø (20), the southern part of Fyn (19), and the eastern coast of South Jutland (16)[264]. Tables 17 and 18 show some typical cases of poaching from Denmark, Sweden and Poland.

Table 17. Information on IUU fishing from media reports and country information (2011, 2012).

Area	Date	Case
Denmark, Bornholm[265]	2012	Fished in closed area. Illegal gear. Fine of 7,500 DKK. Fishing ban for 6 months.
Denmark, Sjælland[266]	2011	Angler sold his catch of eel and trout. Conviction in progress.
Denmark, The east coast of Sønderjylland[267]	2011	Several cases of illegal recreational fishing in Sønderjylland. Until July (23.07.2011) there were 38 cases of illegal fishing, compared to 50 in the whole of 2010. 102 nets and traps were confiscated until July 2011.
Denmark, Bornholm[268]	06.05.2011	In May 2011, the Danish AgriFish Agency found a lot of illegal fishing along the coast of Bornholm. Observers confiscated 40 nets and 11 hocklines within a few days. It is illegal to fish with hocklines between May 1st and September 30, and between May 10th and July 31st, it is illegal to fish with traps, unless special permission has been granted.
Denmark, Fyn[269]	23.04.2010	Inspectors found no less than 39 traps in a conservation belt in Helnæs in November 2010, later they found more traps that had caught 50 trouts. The inspectors believed they were probably meant for selling, which is illegal.
Sweden, Kattegat[270]	29.12.2011	A poacher was fined for using illegal fishing gear to catch eel in Barsebäck.
Denmark, Bornholm[271]	08.03.2012	An angler fished with hook line during closed season. In addition, some fishing nets were not labelled in a lawful manner. The angler received a conviction consisting of a fine on 7,500 DKK, confiscating of nets, and a ban on doing angling fishery for 6 months.

Table 18. Information on IUU fishing from media reports and country information (2011, 2012).

Area	Date	Case
Poland, Gulf of Gdansk[272]	23.11.2011	Poaching: More than half-a-tonne of fish caught illegally with nets. Four poachers were captured by the Maritime Border Guard. Fifty sets of poaching nets with a total length of over two kilometres, and about half-a-tonne of illegally caught fish were confiscated.
Poland, Notec River[273]	18.08.2011	Poachers did not have the appropriate permits to catch fish and had up to 18 pieces bundles and nets (wontons). Coast guards stopped them from fishing from a pontoon in Rożniaty (commune Kruszwica).
Poland, Szkarpawa, Vistula Królewiecka, Tugi and Nogat rivers[274]	06.07.2011	In 2011 more poachers' nets were recovered in Szkarpawa, Vistula Królewiecka, Tugi and Nogat rivers than in 2010. Illegal traps were also found. In 2011, poachers were hit with 29 fines and paid total of 41,000 PLN. As many as 12 of the cases went to court. 32 inspections were carried to find cases of poaching and illegal fishing.
Poland, Vistula river[275]	18.02.2012	Five men with illegal fishing equipment and using illegal techniques were arrested. In total, police seized 32 kg of fish (bream and perch), and confiscated their certification and equipment. They face up to 3 years imprisonment.

Oceana findings: Angling boats, flags of convenience etc.

During the expedition in 2011, Oceana documented many fishing vessels, mainly from Germany, Denmark and Poland carrying out "recreational" fisheries for cod and herring. Those vessels fish outside EU fisheries regulations, without catch limits and without being required to report their catches. Along the German Baltic coast alone, according to the recreational anglers homepages, more than 80 cutters, so called "Fischkutter" offer angling tours in the Baltic Sea[276], usually from six to 11 months a year[277]. They can take up to 50 anglers on board in a day trip and go out every day, weather permitting. Anglers on a typical German Fischkutter, the "Tuemmler" for example, caught 80 tonnes of cod in 2011[278]. The Tuemmler for example is also registered as a fishing vessel in the European fleet register, thus defined as vessels equipped for commercial fisheries[279].

Recreational fishing vessels

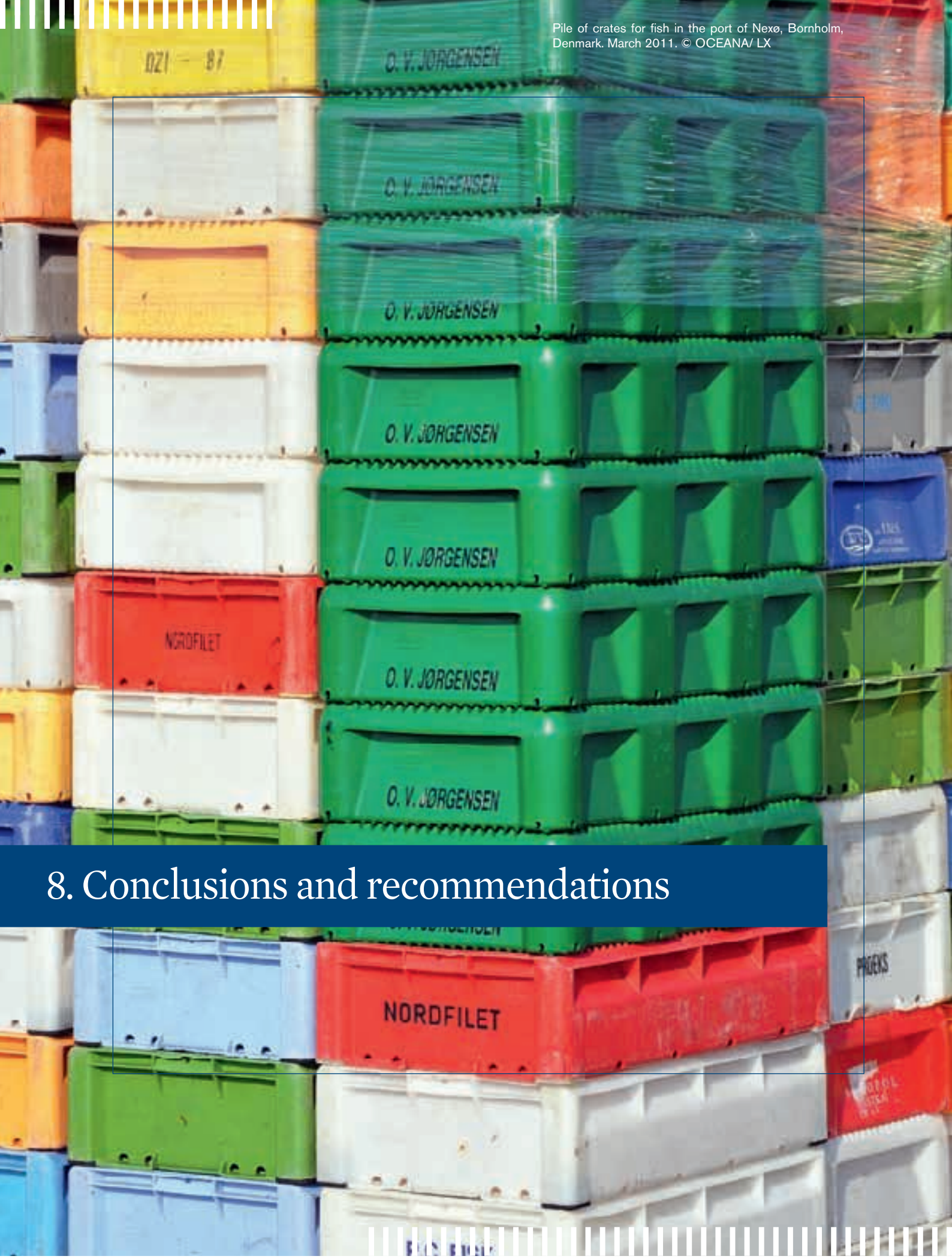
German recreational fishing vessel, Südwind, fishing south of Fehmarn, Germany. May 2011[280]. © OCEANA/ Carlos Suárez

German recreational fishing vessel, Karoline, fishing south of Fehmarn, Germany able to take up to 50 anglers onboard fishing cod[281]. May 2011. © OCEANA/ Carlos Suárez

German recreational fishing vessel, Silverland, fishing near Fehmarn, Germany able to take up to 55 anglers onboard fishing cod on daytrips throughout the year[282]. May 2011. © OCEANA/ Carlos Suárez

German recreational fishing vessel Antares, sailing near Fehmarn, Germany able to take up to 55 anglers onboard fishing cod, flatfish or herring on daytrips throughout the year[283]. May 2011. © OCEANA/ Pitu Rovirosa

The Polish "recreational" fishing vessel UST 124 in the harbour of Ustka and entering the harbour of Ustka, May 2011. According to the EU fleet register this vessel was scrapped using EU fishing subsidies in 2011. © OCEANA/ LX



Pile of crates for fish in the port of Nexø, Bornholm, Denmark. March 2011. © OCEANA/ LX

8. Conclusions and recommendations

EU Member States have committed to fish sustainably, recover fish stocks to the Maximum Sustainable Yield by 2015 and are bound by the Marine Strategy Framework Directive to achieve Good Environmental Status of the EU marine waters by 2020. Past decades of unsustainable fishing practices have put fish stocks in the Baltic Sea and the Kattegat in danger, and some of them are threatened. In addition, overfishing and destructive fishing practices have damaged many important habitats and communities throughout the Baltic Sea area.

In this report Oceana shows, that despite some positive developments in the past years (like some recovery of the eastern Baltic cod stock), a number of unsustainable fishing practices, both legal and illegal, unreported and unregulated still persist in the Baltic Sea. In order to achieve the agreed targets, Oceana recommends a number of measures for environmentally sustainable fisheries management. These include phasing out all destructive fishing practices and the fishing of endangered species, as well as better monitoring, control and surveillance and enforcement of existing laws. Oceana requests strict fisheries management measures inside and outside marine protected areas, to safeguard not only fish stocks but also the entire Baltic Sea ecosystem, the fishing industry, fishing communities and fishermen. The Common Fisheries Policy, currently under reform, has the key role in defining ecological sustainability as the main aim of EU fisheries policy. The sustainability of the social and economic aspects of fisheries can only be achieved by first accomplishing ecological sustainability.

In order to restore Baltic Sea fish stocks and the Baltic ecosystem, Oceana provides the following recommendations.

Recommendations for all fisheries in the Baltic Sea

- Ensure the management of all commercially exploited fish species, moving away from a single species approach and applying an ecosystem-based approach to fisheries management. Management plans and TACs should be introduced for all commercially caught species in the Baltic. The precautionary approach to the management of species has to be applied for species with missing fisheries data, or for which scientific assessments are incomplete. Urgent measures have to be taken to achieve Good Environmental Status by 2020 as requested in the Marine Strategy Framework Directive.
- Immediately stop fishing for endangered species in the Baltic Sea. Ban all eel fisheries in the Baltic Sea and rivers until the European eel has recovered from its almost depleted state.
- Support and expand Baltic Sea artisanal fisheries. Artisanal fisheries provide more employment than their commercial counterparts, are more environmentally friendly, do not destroy the Baltic ecosystem further, are more selective, land high value fresh fish and have a high touristic value.
- Prohibit all destructive fishing methods, including dredging and trawling, in the Baltic Sea. Develop a timeframe for the conversion of these destructive and low selective fishing methods to ones that are more environmentally friendly and highly selective in the Baltic Sea and the Kattegat.
- Improve the selectivity of all fishing gears used in the Baltic Sea to prevent the by-catch of non-target fish species, marine mammals and birds.

- Improve monitoring, control and surveillance in all Baltic Sea countries. Real time satellite monitoring (VMS) should be implemented for all active fishing vessels, specifically for the ones fishing in MPAs.
- No tolerance of any kind of IUU fishing: enforce fisheries regulations rigorously and treat IUU fishing as an environmental crime.
- Manage recreational fisheries. Report all recreational fisheries catches of in all Baltic Sea countries and the Kattegat. Recreational fisheries have to respect closed areas and seasons. Recreational catches should count against the quota allocated for each Member State.
- National governments should immediately develop their own national conservation and fisheries management measures inside the national 12 nautical mile zone as established by the Common Fisheries Policy in order to protect biodiversity inside and outside of MPAs.
- National governments should also implement conservation and fisheries management measures inside the whole EEZ for their fleets that are more stringent than Community legislation.
- Implement of a set of measures that have been proven effective to prevent discards in other fisheries: oblige the landing of all catches, implement a Best Available Technologies (BAT) approach, improve the selectivity of fishing gears; spatial management: closing areas in real time, closed seasons, obligation to change fishing grounds and creation of preferential access zones; prohibit high grading effectively.
- Fisheries not intended for direct human consumption should be stopped in the Baltic Sea.
- Salmon fishing in the open Baltic Sea should be banned and only rivers with viable populations should be allowed when they migrate back to the sea to ensure the genetic diversity of the stocks.

Recommendations for fisheries inside Marine Protected Areas

Oceana urges that the following fisheries management measures be implemented inside Marine Protected Areas.

- MPAs should in general consist of two zones: no-take zones and buffer zones:
  - No-take zones are closed for fisheries and all types of human activity except for scientific research activities.
  - In the buffer zone, low-impact activities (artisanal fishing, scuba diving, etc.) could be allowed when carefully managed.
- MPAs need to be large enough to allow the establishment of no take zones. If the MPAs are too small for this, no fishing should be allowed.
- No-take zones are expected to produce the following benefits as a result of the elimination of fishing:
  - Increase of abundance and density of commercial species with reduced mobility.
  - Increase of average size, especially for long-living species with slow growth rates and large maximum sizes.
  - Recovery of the shallower areas being more vulnerable to fishing pressure by both recreational and commercial fisheries.
  - Improvement of the quality of habitats within the protected area compared to the outside by the removal of disruptive human activities.
  - Increase in the size and number of species with longer migratory distances because of improved habitat quality and abundance of food.
  - Contribution to the neighbouring areas because of a spillover effect.

- Trawling, dredging and any other fishing with towed gears should be prohibited in MPAs.
- Recreational fisheries should be effectively controlled and widely restricted inside MPAs.

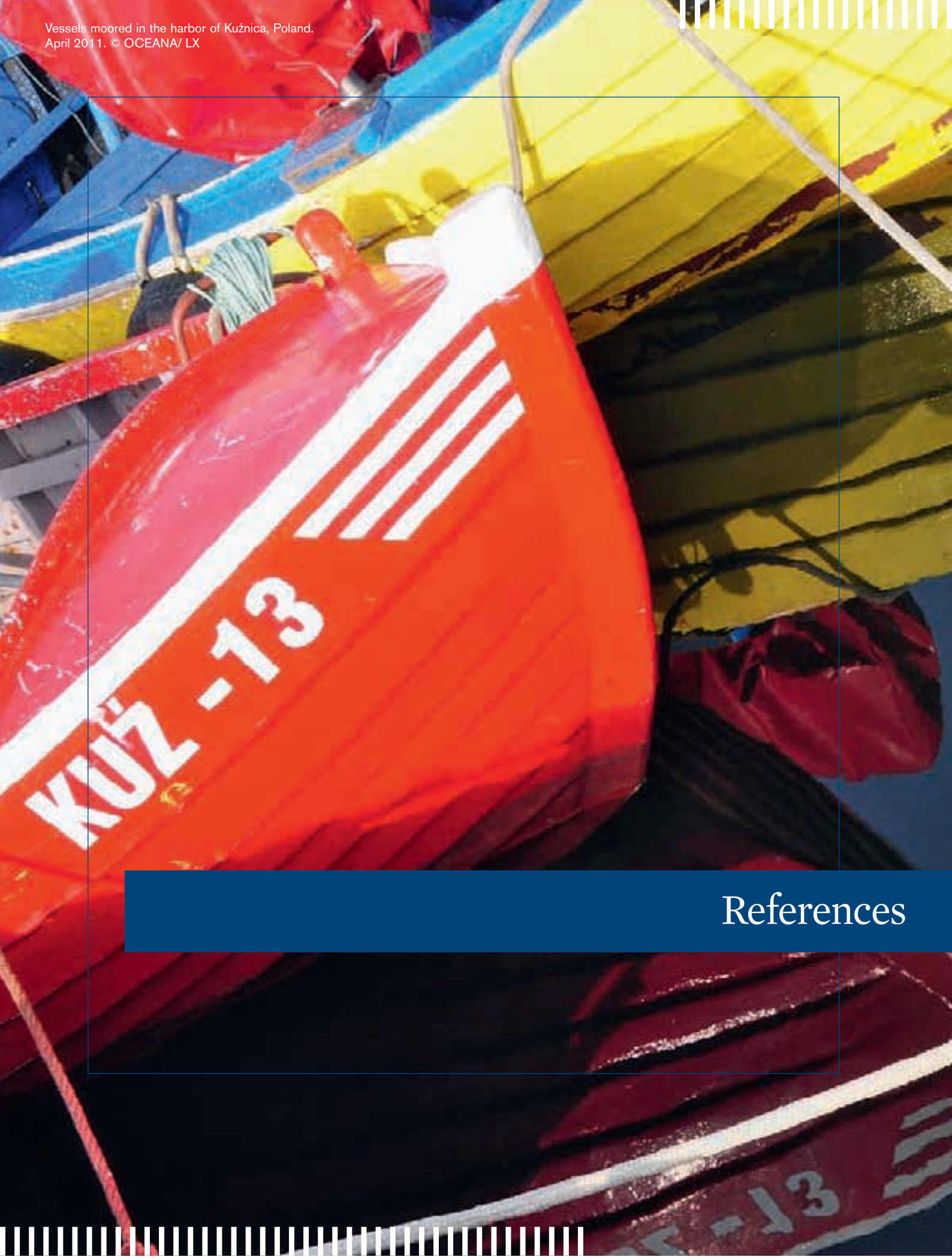
Recommendations for the Common Fisheries Policy:

- *The Common Fisheries policy should prioritise ecological sustainability:* The sustainability of social and economic aspects of fisheries can only be achieved by first accomplishing ecological sustainability and therefore minimising the existing/potential adverse impacts and pressures of fisheries activities, while at the same time allowing the recovery of stocks or populations that are depleted or at risk of depletion. Securing ecological sustainability will result in long-term beneficial economic and social outcomes for the fishery sector and other coastal activities (such as tourism).
- *The Common Fisheries Policy should apply an ecosystem-based approach to the management of fishing activities:* Restoring ocean ecosystems, including rebuilding marine biodiversity and allowing species to recover from exploitation, requires moving away from fisheries management based on the single species approach. Instead, what is needed is management of the entire ocean ecosystem, which aims to stop biodiversity loss and rebuild the natural diversity of the oceans, thereby enhancing their resilience. Given that the Marine Strategy Framework Directive Article 13 states that good environmental status shall be reached by applying an "ecosystem-based approach" to fisheries management, the future CFP must make a significant step forward and apply an ecosystem-based approach.
- *The Common Fisheries Policy should implement a science-based approach:* Over the last 20 years, ICES has produced over 1,500 scientific opinions for the EU and other governments in the Northeast Atlantic for the correct management of fish stocks. However, only 350 (22%) have been properly translated into effective catch limits – 78% of scientific recommendations on TACs for European Union fish stocks have been continuously ignored. When the Council of Fish Ministers decided on fishing opportunities for 2011, it still ignored approximately 35% of the scientific recommendations made by ICES.
- *The Common Fisheries Policy should effectively apply the precautionary approach:* The ecosystem approach to fisheries management must apply the precautionary approach, which mainly involves applying precautionary management measures when there is a lack of scientific knowledge or advice. Fisheries must not operate without management measures and new fisheries should only operate when there is proof that they do not harm the ecosystem.
- *The Common Fisheries Policy should implement a flexible approach based on the protection of Essential Fish Habitats:* In recent years, the degradation of marine aquatic habitats essential for healthy fish populations has increasingly been recognised as a global concern. Consequently, the importance of habitat management within fisheries management is being increasingly viewed as a key component of an ecosystem-based approach. Essential Fish Habitats are the fragile and vital marine habitats that need to be protected due to their vital role in supporting the biological needs of fish species (e.g., spawning, nursery, and feeding grounds). The concept of Essential Fish Habitats is a useful ecosystem-based management tool

for limiting fishing mortality and the environmental impacts of fishing activities.

- *The Common Fisheries Policy should end the wasteful practice of discards:* In Europe, around 1.3 million tonnes of marine fish are discarded every year, representing 13% of total catches. Because in most cases discards do not survive, this practice undermines the health of stocks and jeopardises future yields, threatening the long-term economic sustainability of European fisheries.
- *The Common Fisheries Policy should ensure the management of all commercially exploited species:* Several hundred marine species are commercialised in the European Union. However, only a small fraction is actually managed, and unmanaged species represent a significant proportion of total landings in the EU. This single fact strongly hampers the implementation of all of the key principles that should guide the future CFP. Therefore, in order to be consistent with the Marine Strategy Framework Directive, the renewed CFP should guarantee that *all* exploited fish stocks be managed.
- *The Common Fisheries Policy should ensure consistency with international and European objectives for biodiversity protection:* The Common Fisheries Policy must integrate the objectives set forth in other biodiversity laws and conventions, in order to secure both the ecological sustainability of the seas and the long-term viability of fisheries activities. The CFP should be consistent with the objectives of the Habitats Directive, the Marine Strategy Framework Directive, Convention on Biological Diversity, the Barcelona Convention, the Helsinki Convention, the OSPAR Convention, and the Convention on the Conservation of Migratory Species.
- *The Common Fisheries Policy should ensure that Good Environmental Status be achieved by 2020:* The Marine Strategy Framework Directive sets a binding roadmap to achieve GES in European seas by 2020. This requirement identifies clear boundaries concerning fisheries activities to be carried out in European seas. Oceana recommends that the renewed CFP place at its core the target of achieving GES by 2020, in order to be consistent with the Marine Strategy Framework Directive.
- *The Common Fisheries Policy should compel Member States to control and enforce fishing rules:* Even the best text for a renewed CFP will fail if Member States do not ensure that fishermen follow the rules. In fact, every year, the European Commission reports an increasing number of infringements against the Common Fisheries Policy. The lack of political will to ensure compliance is one of the primary reasons for the failure of the CFP of 2002.

Artisanal fishing vessel at the beach in Orłowo, Poland. April 2011. © OCEANA/ LX



Vessels moored in the harbor of Kuźnica, Poland.
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(a) they apply solely to fishing vessels flying the flag of the Member State concerned and registered in the Community or, in the case of fishing activities which are not conducted by a fishing vessel, to persons established in the Member State concerned and

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Artisanal fishing vessel on the beach, Piaski, Poland. April 2011. © OCEANA/ LX

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