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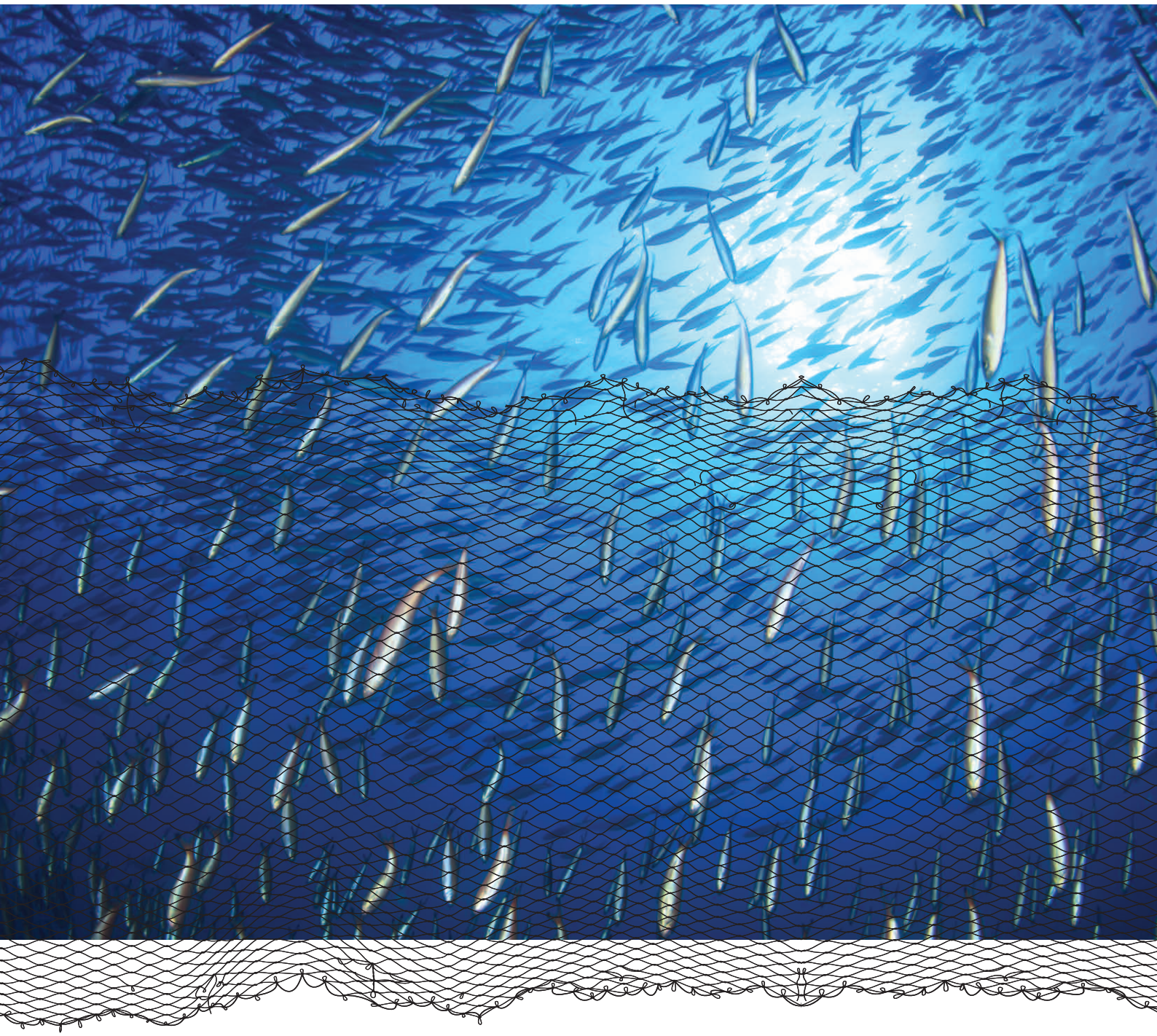

5-year review (2014-2019) of the EU Common Fisheries Policy

BfN Federal Agency for Nature Conservation

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Introduction

Common Fisheries Policy (CFP) reform was ratified in December 2013. Since 1/1/2014, it has been valid for all European fisheries. The goal of the reform was to make fisheries more sustainable. The harmful impacts of fisheries on the marine ecosystem should be minimised and a sustainable use of our marine biological resources should be made possible and promoted.

This study takes stock of five years under the CFP, examining the development of European fish stocks, the integration of conservation issues, and interfaces with the Marine Strategy Framework Directive (MSFD), but also considers economic concerns such as the creation of incentives for the fishing industry and evaluates the extent to which important sustainability targets have been achieved.

Commitment to the goal of rebuilding overfished stocks and keeping them above the biomass level that produces the maximum sustainable yield was considered a great advance of the CFP reform. The extent to which this progress has had positive effects on fish stocks is examined in Section 1.

In Section 2 the integration of conservation concerns into the reformed CFP is discussed: The regionalisation concept provides for general goals to be established at the EU level. Member states translate those goals to tailor technical measures at the regional level as part of the usage regulations and to stock conservation measures as part of conservation obligations. Another important component of the reformed CFP was the introduction of the landing obligation (and the discard ban) which was put into force incrementally starting on 1/1/2015 and has been fully in force throughout Europe since 1/1/2019. Its effectiveness is assessed in Section 2, and in Section 3 the extent to which sanctions and monitoring measures are being better implemented under the CFP reform is discussed in more detail.

In Section 4 the interplay between the CFP with the MSFD is analysed. The targets of the MSFD obligate EU member states to achieve “good environmental status” in their marine waters by 2020. The section shows how achievement of these targets is greatly dependent on the CFP.

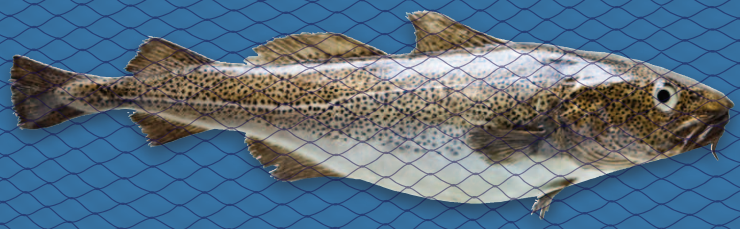
To promote acceptance in the fishing industry of the changes of the CFP, economic incentive systems must be created. Section 5 focuses on options for reducing overcapacities, using German fisheries as an example, and shows the policy instruments that are available – from incentive-based to alternative income programmes in fisheries management – and best-practice examples that already exist in the EU.

Have the negative effects of EU fishery been reduced, and could better protection of sensitive habitats and species be implemented? To what extent have structural deficiencies been named, but not (or only partially) corrected, in the last reform? These essential questions, possible further developments, and an expansion of further instruments for preventing the integration of CFP environmental concerns from coming to nothing are discussed in Section 6. In the annex of this study, the ten most important requirements to achieve the CFP sustainability targets are summarized.

GLOSSARY	
AC	Advisory Council
AIS	Automatic Identification System
ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas
AWZ	Exclusive Economic Zone
BLE	Federal Agency for Agriculture and Food
Blim	Limit reference point for spawning stock biomass (SSB) that must in no case be undercut so that a stock's reproductive capacity is not compromised.
BMEL	Federal Ministry of Food and Agriculture
BMSY	Spawning stock biomass (SSB) that results from fishing at FMSY for a long time.
Bpa	Precautionary reference point for spawning stock biomass (SSB). Safety margin to the limit reference point that factors in uncertainties in stock assessments. Stocks above Bpa have full reproductive capacity while those below Bpa run the risk of their spawning biomass falling below Blim and their reproductive capacity thus being compromised.
BR	Basic Regulation
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CCS	Conservation Credits Scheme
CCTV	Closed-Circuit Television
CFP	Common fisheries policy
EASME	Executive Agency for Small and Medium-sized Enterprise
EFCA	European Fisheries Control Agency
EEZ	Exclusive Economic Zone
EG	European Community Regulation
EIR	Electronic system of inspection report
EMFF	European Maritime And Fisheries Fund
EP	European Parliament
EU	European Union
EuGH	European Court of Justice
EC	European Commission
EUV	Treaty on European Union
EWG	Expert Working Group
F	Fishing mortality
FAO	Food and Agriculture Organization of the United Nations
Flim	Limit reference point for fishing mortality (based on the precautionary ap-proach) that must in no case be exceeded so that a stock's reproductive capacity is not compromised in the medium term. Where F remains above Flim over long periods, the probability that biomass falls below Blim increases.
FMSY	Reference point for fishing mortality consistent with achieving Maximum Sustainable Yield (see MSY)
Fpa	Precautionary reference point for fishing mortality (based on the precautionary approach). Safety margin to the limit reference point that factors in uncertain-ties in stock assessments. Stocks below Fpa are being sustainably managed, yet not always optimally managed (see MSY).

F-ranges	Ranges of fishing mortality that management receives from scientists as part of a scenario query designed to deliver no more than a 5% reduction on MSY.
GEOMAR	Helmholtz Centre for Ocean Research Kiel
GES	Good Environmental Status
GT	Gross Tonnage
HCR	Harvest Control Rules. Set of measures required to achieve the management objective.
HELCOM	Helsinki Commission on the Protection on the Baltic Sea
ICES	International Council for the Exploration of the Sea
LLUR	State Agency for Agriculture, Environment and Rural Areas
MAP	Multi-annual management plan
Mofi	Mobile Fisheries Log
MoU	Memorandum of Understanding
MPA	Marine Protected Areas
MSDF	Marine Strategy Framework Directive
MSY	Maximum Sustainable Yield. Maximum catch a fish stock can permanently pro-vide without being damaged. The concept of MSY requires that all living marine resources be managed in such a way that the yield (here: the catch) is opti-mised in the long-term. To this end, a target reference point for biomass (BMSY) and a reference point for fishing mortality (FMSY) are determined.
MSY Btrigger	Spawning stock biomass triggering a specific management reaction. In the context of MSY, this is the lower limit of the ranges around BMSY.
NGO	Non Governmental Organisation
OP	Operational Programme
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PECH	The European Parliament Committee on Fisheries
PO	Purchase Order
RAC	Regional Advisory Council
REFIT	Programme that ensures the efficiency and capacity of legislation
REM	Remote Electronic Monitoring
SSB	Spawning stock biomass. Total weight of all sexually mature fish in the stock.
SPD	Social Democratic Party of Germany
SRU	German advisory council on the environment
STECF	Scientific, Technical and Economic Committee for Fisheries
TAC	Total Allowable Catch. Statutory maximum catch (in EU waters since 2014: statutory maximum landings
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
UNFSA	United Nations Fish Stock Agreement
VMS	Satellite based Vessel Monitoring System
WGECO	The World Green Economy Council

CHAPTER 1 | STATE OF FISH STOCKS SINCE CFP REFORM



Karoline Schacht

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CHAPTER 1 | STATE OF FISH STOCKS SINCE CFP REFORM

1. The 2013 CFP reform: Impetus for stock recovery

1.1 New management objectives: MSY for all EU stocks // Landing obligation

Ever since the most recent reform of the EU Common Fisheries Policy (CFP) in 2013, the main objective of European fisheries management has been to "ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield" (Article 2(2) of the Basic Regulation).[1] With the adoption of the new CFP, the EU Member States haven undertaken to achieve a maximum sustainable yield exploitation rate by 2015 where possible and "on a progressive, incremental basis at the latest by 2020 for all stocks".

This realignment of the key management objective of European fisheries policy became necessary when all previous reform efforts ended with the same result: Throughout, the state of EU fish stocks remained deplorable. The end of 2018 saw the expiry of the first half of the 10-year term of the package of policies and measures – reason enough to now take a closer look at the current status of implementation and recent trends in stock development. What improvements have been made, what amendments are still necessary, and what are the expectations for the second half of the CFP term?

One major change in European fisheries management since the reform has been the introduction of a discard ban for all fish subject to catch limits or quota. On the one hand, the ban – also termed "landing obligation" – is meant to counteract disproportionately high discard rates. On the other hand, it serves to hold fishermen immediately accountable for their catches and not just their landings. The strategic reasoning behind the landing obligation dates back to the year 2007, when growing reports on enormous amounts of discards in parts of the European fisheries surfaced, to which the Commission responded by publishing its political communication on the reduction of unwanted bycatch and the progressive elimination of discards.[2] At the time, the proposed measure was not implemented. **However, under the new CFP, implementation of the landing obligation started in 2015 and shall continue on a progressive, incremental basis until 2019, in what may well be regarded as the single most important paradigm change in the history of European fisheries management (see 5., chapter 2 below for further details).**

1 *European Union (2013).*
2 *EU Commission (2007).*

1.2 New ways of political participation

Prior to adoption of the Lisbon Treaty, the political structures underlying fisheries policy had one effect above all else: Between 2003 and 2011, fisheries ministers' decisions resulted in catch limits that were on average 45 % higher than the relevant recommendations by the International Council for the Exploration of the Sea (ICES). Although this excess decreased from 48 % in 2009 to 23 % in 2011[3], catch limits continued to exclusively factor in the amount of fish landed and fail to take into account any share of a catch discarded at sea.[4]

The 2009 Treaty of Lisbon establishes "co-decision as the main decision-making procedure for matters falling under the CFP". Article 43(3) of the Treaty provides for an exemption for measures "on the fixing and allocation of fishing opportunities"[5], which are to be adopted by the Council, on a proposal from the Commission, without the involvement of the Parliament. The EU Commission emphasises the necessity to examine thoroughly the recurrent content of the yearly Council regulations on fishing opportunities in order to see "which of their provisions can be included in a measure based on Article 43(3)"[6] of the Lisbon Treaty.

In the European Parliament (EP), it is the Committee on Fisheries (PECH) that is primarily concerned with the political parameters impacting European fisheries. During the last reform, German MEP Ulrike Rodust (SPD) acted as rapporteur for the dossier on the new Basic Regulation. She believes that a realignment of the Common Fisheries Policy was long overdue,[7] and that the fact that the European Parliament was an equal partner in the reform process allowed for Europe and its new CFP to evolve from lagging to leading in the realm of international fisheries policy. For Rodust, one major outcome has been a much stronger emphasis on scientific criteria as opposed to national self-interests. However, from today's perspective, she sees these and other important environmental policies in danger: Rodust claims that the ongoing shift towards Conservative/right Conservative in parliamentary powers is making itself felt, meaning that already in the current legislative period a CFP in its present form would have fallen through – an assessment shared by Swedish MEP Linnéa Engström (Greens/EFA), who as shadow rapporteur for the North Sea Multi-Annual Plan also has a great deal of experience with political blockades. It therefore seems likely that the EU Parliament may decide not to prosecute, or even condemn, potential non-compliance with CFP targets (such as the "2020 Objective"*).

3 *EU Commission (2012).*
4 *World Wide Fund for Nature (WWF, 2012).*
5 *European Union (2007).*
6 *EU Commission (2009).*
7 *https://www.ulrike-rodust.eu/2013/12/10/europaeisches-parlament-verabschiedet-verordnung-ueber-nachhaltige-fischereipolitik/*

* *The objective of achieving the maximum sustainable yield (MSY) exploitation rate by 2020 for all European fish stocks.*

Elimination of discards by landing obligation since 2015 – a path of trial and tribulation

The CFP reform was further based on the idea of increasingly shifting responsibility for conservation measures to the Member States cooperating on a regional level.[8] This form of regionalisation shall help create solutions at regional level that best reflect the specific characteristics of each local fishery while bearing in mind the actual circumstances and challenges of today's fisheries. For the North Sea this cooperation structure is the "Scheveningen Group", for the Baltic Sea region it is "Baltfish".

Further, in the various marine regions, the Regional Advisory Councils (RACs) initially founded in 2003 have since developed into Advisory Councils (ACs) that serve as a cooperation platform for fisheries stakeholders. ACs are effectively dominated by the fisheries industry, with 60 % of their members representing the professional fisheries sector – fishermen, shipowners, producers' and processors' associations, as well as trade and market representatives – while the remaining 40 % represent other interest groups such as anglers, recreational fishermen, consumer organisations, and environmental and nature conservation groups.

One major change for ACs since the 2013 reform has been who they actually advise: In the past, RACs used to develop position papers to be provided to the Commission. They also regularly submitted advice to the various co-decision bodies and accepted invitations from the Parliament's Committee on Fisheries. By contrast, since 2014, ACs have been responsible for providing recommendations and information on fisheries management and related socio-economic and environmental issues to both the EU Commission and Member States. Recipients of the advisory expertise are then "high level groups" in the various regions who in turn are obliged to consult the ACs' position for their own joint recommendations before submitting the latter to the Commission. However, some of the environmental groups represented in ACs have voiced their concern that these consultations are regularly being cancelled or delayed.[9]

8 *Deutsche Umwelthilfe (2016).*

9 *EU Parliament, PECH Committee (2017).*

2. Trends and developments in fish stock status from 2008 to 2018

2.1 What was the state of EU stocks halfway through the term of the old CFP?

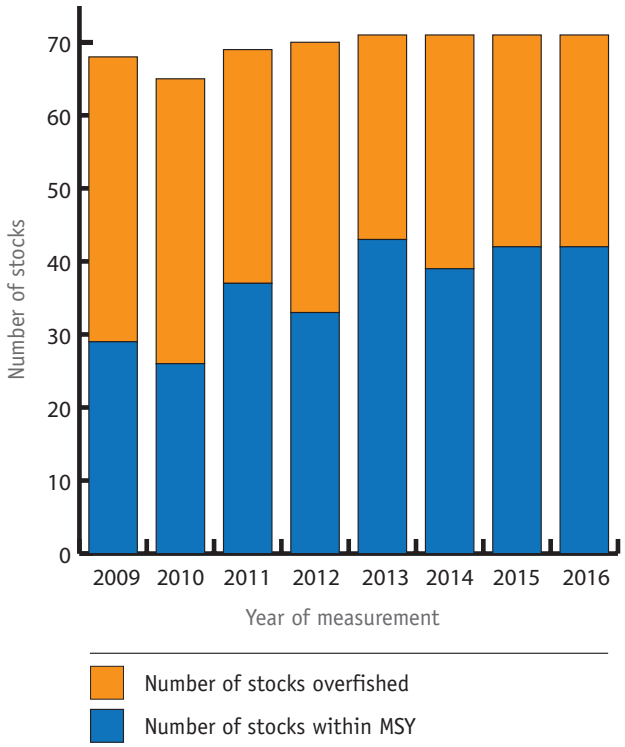
In 2008, halfway through the term of the former CFP, almost 90 % of scientifically assessed fish stocks in northern European waters (EU excluding the Mediterranean) were found to be overfished (population size below B_{pa} or fishing mortality above F_{pa}).[10] Sufficient data was only available for a small number – a mere 31 % – of commercial stocks in the area.

In its mid-term review of the last CFP, the European Commission had highlighted "the lack of concrete progress since the 2002 reform of the Common Fisheries Policy (CFP). In particular, TACs are consistently set too far above scientific advice to allow overfished stocks to recover [...]. As a result, 88% of EU stocks are overfished, compared with 25% on average globally."[11]

This was a remarkably honest analysis, with a clear focus on stock recovery. It led to a proposal for action designed to attach even higher priority to this very objective: more flexible TAC adaptations which would enable both more effective recovery measures for overexploited stocks by means of fishing limits and better fishing opportunities for fishers when stocks do recover.

	2004	2005	2006	2007	2008
Total EU stocks (ICES WGs)	86	96	94	84	89
Total assessed EU stocks (ICES)	30	19	31	29	28
No assessment data	56	77	63	55	61
Overfished	30	18	29	26	25
Number of stocks exploited sustainably	-	1	2	3	3
% overfished (relative to total assessed stocks)	100%	95%	93%	88%	88%

Tab. 1: Total number of European fish stocks, scientifically assessed and not assessed. Source: Agnew, D. et al. (2010).



As a result, in 2013, the EU Commission found that in the course of a decade the percentage of overfished stocks had dropped from 94 % in 2005 to 39 %.[12] However, in its 2018 assessment, the Commission's Scientific, Technical and Economic Committee for Fisheries (STECF) notes that this trend has since considerably slowed down and even started moving back in the opposite direction in 2015 with a rate of overfishing of 41 % (Fig. 1).[13]

Fig. 1: Stocks in the North-East Atlantic and adjacent waters. Stocks overfished (orange), stocks within MSY (blue). Source: STECF (2018).

10 Agnew, D et al. (2010).

11 European Commission (2008).

12 European Commission (2013).

13 STECF (2018).

With the deadline of the current CFP term (2020) fast approaching, substantial efforts need to be made by political decisionmakers to meet the legal requirements of the CFP and "reap the many ecological, economic and social benefits that can be brought about by ending overfishing".[14]

2.2 Has the state of fish stocks in EU waters improved since introducing MSY?

"The Commission feels that fishing at MSY levels would help reverse the trend of allowing aquatic stocks to run out. This approach would benefit the sea environment as a whole: Exploitation of stocks will become less problematic once the availability of resources becomes more stable again. Fishing within MSY limits will mean that the number of large-scale and high-value catches will increase while the proportion of discards will decrease."

Between 2005 and 2015, scientific data was available for 61 and 69 stocks, respectively, in the area under scrutiny by the Council for the Exploration of the Sea (ICES). During this 10-year period, the percentage of stocks overfished declined from more than 70 to around 40 %. The percentage of stocks outside safe biological limits (with a fishing mortality above F_{pa} and/or biomass below B_{pa}) showed a similar downward trend during the same period, dropping from 65 % in 2003 to 38 % in 2015.[15]

School of herrings (Clupea harengus)

In their CFP progress report, the STECF experts highlight that while the general state of fish stocks has noticeably improved, many stocks in the ICES area continue to be overfished (with a fishing mortality above F_{MSY}) and that, as stated above, the speed of recovery has significantly deteriorated in recent years. The STECF assessment did compute a general downward trend for the indicator for fishing pressure (F/F_{MSY}) in the ICES area during the time period from 2003 to 2016: While it was on average 1.5 times above F_{MSY} in the early 2000s, in 2016, it had stabilised at a level of around 1.[16] The EU Commission condones this assessment: **"According to STECF, in the ICES area, fishing mortality is decreasing steadily and the indicator value in 2016 was close to 1 (compared to 1,5 in 2003), which means that over all stocks exploitation levels are, on average, close to F_{MSY}."[17] However, this was found to not be true for the Mediterranean and Black Sea, where the trends in F/F_{MSY} show a median level that varies slightly, staying at around 2.3. And STECF itself notes that the indicator has not dropped any further since 2011. The changes in indicator value show that the progress made until 2016 has been too slow to be able to rebuild all stocks to B_{pa} level or above and to manage them at F_{MSY} by 2020**. What's more, the EU Commission holds the view that "ensuring that all TACs are at F_{MSY} at all times is a challenge"[18], which is a misinterpretation of the CFP objectives, as the latter specifically do not require for fishing intensity to be at F_{MSY} at all times. Rather, in order to reach the central CFP objective (to recover and maintain stocks above levels that can produce MSY), fishing mortality must be below F_{MSY} at all times – and even significantly below F_{MSY} for stocks in mixed fisheries.

2.3 What is the state of fish stocks globally?

Here is a look at the global situation: The report on the state of world fisheries and aquaculture by the Food and Agriculture Organisation of the United Nations (FAO)[19], published every two years, devotes one chapter to the state of scientifically assessed fish stocks. Stock status is classified into three categories: overfished/rebuilding, maximally exploited, and not fully exploited/"underfished". At a closer look, the ostensibly clear categorisation contains several points of confusion: First, it is conceded that the stocks summarised by the report account for only around 10 % of global commercial stocks. Second, for the middle category, a definition is used that over the years has been modified several times – from "fully exploited" (2010) to "fully fished" (2014) to "maximally sustainably fished" (2018).

14 *Poseidon (2017).*

15 *Communication from the Commission to the Council and the European Parliament: Implementing sustainability in EU fisheries through maximum sustainable yield.*

16 *STECF (2017a).*

17 *European Commission (2018), p. 2*

18 *Ibid., p. 10.*

19 *FAO SOFIA Report 2018, p. 39.*

Such rewording raises the question of whether there is in fact one consistent definition on which the category is based. Still, fisheries management claims that all stocks falling into the fully exploited, fully fished, or maximally sustainably fished category are being "optimally" managed and have abundance at or close to the level of MSY. In the current FOA report on commercial stocks published in 2018 and based on stock data from 2015, this is said to be true for 59.9 % of stocks (Fig 2).[20]

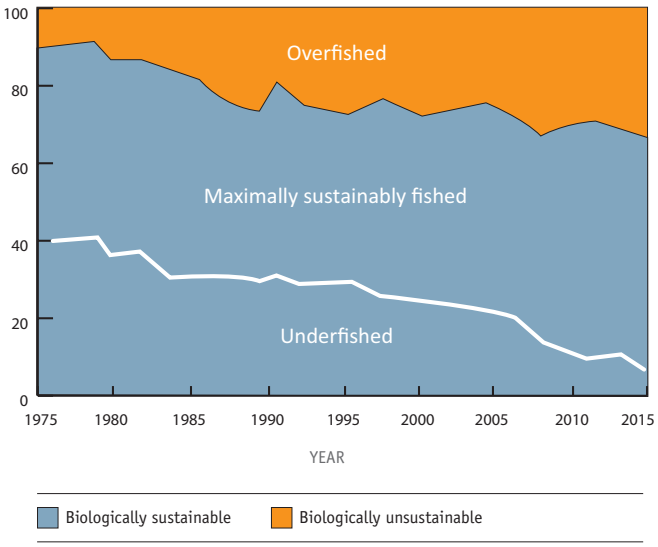


Fig. 2: Global development of overfished, underfished, and „maximally sustainably fished" stocks between 1975 and 2015. Source: FAO SOFIA 2018.

The universally agreed management objective also applicable to EU fisheries is based on stock size. The indicator used to determine progress is the proportion of fish stocks that are maximally sustainably fished (in line with MSY) – one of the categories marked in blue in Fig. 2 and indicating a significant decline over the decades. The only variable fisheries management can directly control in order to meet the set targets is and remains fishing intensity (F)*.

2.4 How have stocks developed within and outside safe biological limits?

In the progress report prepared by STECF, for the year 2016, around 30 % of scientifically assessed stocks in EU waters are described as being outside safe biological limits (either F>F_{pa} or B<B_{pa}, as marked by the orange line in Fig. 3), in contrast to 65 % in 2003. At the same time, the report finds that both reference points were available for a mere 46 stocks in the ICES area.[21] The red line in Fig. 3 illustrates the proportion of stocks with a fishing pressure above F_{MSY} or spawning stock biomass below MSY $B_{trigger}$ during the time period from 2003 to 2016.

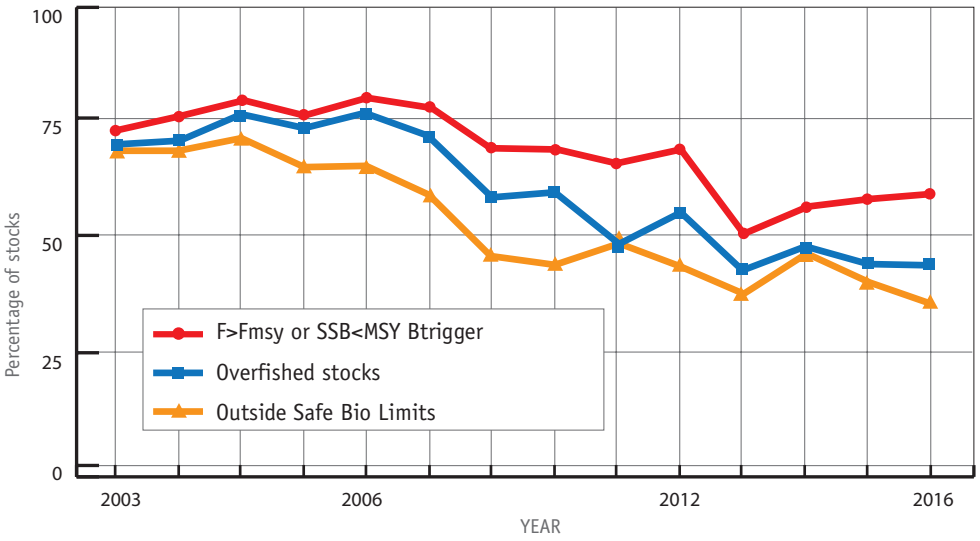


Fig. 3: Trends in stock status, 2003-2016. Blue indicator: Proportion of overfished stocks (F> F_{MSY}) within the sampling frame (65 to 71 stocks fully assessed in the ICES area), orange indicator: Proportion of stocks outside safe biological limits (F>F_{pa} or B<B_{pa}, for 46 stocks), red: F>F_{MSY} or SSB<MSY $B_{trigger}$. Source: STECF (2018).

20 *Ibid.*

* *Note: The FAO report is regarded as the single most important publication on the state of world fisheries. It is based on the analysis of data on around 500 commercial fish stocks, representing an estimated one-third of the world's exploited fish stocks. In order to be able to assess stocks in relation to their MSY, there must at least be estimates on the applicable F_{MSY} reference points. To date, within the EU such estimates have only been available for just under 50 %, or 69 out of 140, commercial stocks assessed by ICES.*

21 *STECF (2017a).*

The indicators show **that overall progress in stock status has been slow. Moreover, the decline in overexploited stocks seems to decelerate since 2013, with the relevant value even rising back up to around 60 %. To date, the exact number of stocks above or below B_{MSY} remains unknown as ICES so far has only been able to estimate this key indicator for a small share of stocks.** Yet although ICES therefore does not consider the indicator useful at this stage, in its CFP progress report, STECF points out that "ICES is in the process of shifting MSY $B_{trigger}$ settings to levels which increase the probability of keeping F at F_{MSY}, making it a good proxy for B_{MSY}. Nevertheless, there are still 40 out of 69 stocks relevant for this exercise, with MSY $B_{trigger}$ set at B_{pa}".[22] STECF further emphasises that as soon as a representative number of B_{MSY} estimates become available for use in ICES assessments, the proportion (and number) of stocks below or above this reference point should become part of the core indicator set.[23]

In their analysis of current estimates regarding fish stock status, Hilborn & Ovando (2014) find that in general, stocks for which scientific assessments are available are in better condition, with a tendency to recover rather than degenerate*. Also, the authors show that larger stocks were generally in better condition than smaller ones. They interpret these results as a confirmation of their initial assumption that over time, stocks managed shape up better than stocks left unmanaged. Further, Hilborn & Ovando found that larger stocks receive significantly more attention from management than small(er) stocks, with the majority of unassessed stocks not being managed in all. They conclude that fisheries management as currently practised can indeed promote sustainable fisheries and that in the long run, it will be crucial to extend management also to data-poor stocks in all oceans.[24]

Beam trawler in a German harbour

22 *STECF (2018).*

23 *Ibid.*

* *Quote from Hilborn & Ovando: „We review the available estimates of the status of fish stocks from three sources: the FAO's State of Marine Resources, a database on scientific stock assessments, and recent estimates from statistical models designed to determine the status of unassessed fish stocks."*

24 *Hilborn, R. & Ovando, D. (2014).*

2.5 Why does fisheries science criticize the choice of reference points?

MSY-$B_{trigger}$ is currently regarded as the biomass reference point, marking the minimum threshold for stock fluctuation around the biomass target value B_{MSY}. In line with fisheries management based on the precautionary approach, as soon as stocks reach or even fall below this point, action needs to be taken such as reductions in fishing mortality to enable stocks to quickly recover and fluctuate around B_{MSY} again. The concept of MSY-$B_{trigger}$ was developed from the reference point B_{pa} which ICES has been using as a basis for its advice since the late 1990s and which in turn is calculated from B_{lim}, the standard computation being: $B_{pa} = B_{lim} * 1.4$.[25]

Yet to what extent does the application of "MSY-$B_{trigger}$" reflect the primary objective of the reformed CFP? In their 2017 analysis, fisheries consultants group Poseidon found that in 2016, around one quarter of stocks had a spawning stock biomass below the level of MSY-$B_{trigger}$ and voiced its concern that the reference point chosen was in fact inadequate to measure progress towards the CFP's biomass objective.[26] **MSY-$B_{trigger}$ can only serve to indicate the lower limit around which B_{MSY} fluctuates, whereas the CFP aims at having managed stocks reach a level of biomass above B_{MSY}.** The use of MSY-$B_{trigger}$ as proxy is particularly problematic where the reference point computed for a given stock corresponds to the old precautionary level or B_{pa}.

The wording of the global sustainable development goal (SDG) for the oceans indicates the direction fisheries management is actually supposed to take. SDG 14.4 sets forth the objective "to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield...". This can only be achieved if fisheries management takes adequate action, with a particular focus on the MSY benchmark as newly proclaimed management objective. In the vast majority of cases where fish stocks need to be stabilized or rebuilt to levels that are consistent with achieving maximum sustainable yield, fishing pressure – one of the variables management can directly control – must be reduced. The first efforts in this direction date back to before the last reform: The 1995 United Nations' Global Fish Stocks Agreement (UNFSA, New York 1995)[27] already outlined this goal as item 7 of Annex II:

25 *ICES (2015).*

26 *Poseidon (2017).*

27 *United Nations (1995).*

"The fishing mortality rate which generates maximum sustainable yield should be regarded as a minimum standard for limit reference points." Annex II further stipulates just how these reference points shall be determined, requiring the adoption of a) "limit" reference points designed to drive conservation of stocks, or b) "target" reference points designed to drive achievement of management objectives.[28] While limit reference points set boundaries designed to constrain harvesting within safe biological limits within which stocks can produce maximum sustainable yield, target reference points are intended to meet management objectives and must "on average" not be exceeded.

Catch Bretagne

School of cods North Sea

The UNFSA provides that the fishing mortality rate which eventually generates maximum sustainable yield must be regarded as limit reference point. In practice, this would mean that target reference points need to be set below F_{MSY} to effectively ensure that stocks are not overfished.

Where stock size does fall below such reference points, or fishing mortality rises above the respective thresholds, management shall initiate a previously agreed set of conservation and management measures in accordance with the stipulated "Harvest Control Rules (HCR)". This is illustrated by, e.g., the latest ICES advice for cod in the Western Baltic Sea which states that when the EU multiannual plan (MAP) is applied, total catches in 2019 that correspond to the so-called "ranges" will be between 9,094 tonnes and 23,992 tonnes. Catches corresponding to $F>F_{MSY}$ (15,021 tonnes) can only be made under conditions specified in the MAP, whilst "the entire range is considered precautionary when applying the ICES rule".[29] This statement, which is also applied to other Baltic Sea stocks, suggests that even catches above F_{MSY} may be in line with the precautionary approach, which is not the case. As a result, stocks like the Western Baltic cod are potentially exploited at high risk rather than on the basis of the precautionary approach, as several legal requirements are failed to be complied with:

1. The obligation to manage stocks in a way that allows for them to reach or maintain a biomass above levels which can produce the maximum sustainable yield (as per CFP, Article 2.2, and the Marine Strategy Framework Directive (MSFD), Articles 3.1 and 3.2),
2. a population age and size distribution that is indicative of a healthy stock (as per MSFD 3.3), as well as
3. a stock's capacity to fulfil its role as prey and/or predator in the ecosystem (various articles of CFP and MSFD).

A task force installed in 2014 and comprising the EU Commission, the EU Parliament, and the Council of Fisheries Ministers proposed the use of further so-called "ranges" around F_{MSY} as flexible targets for regional management plans besides the established HCRs[30], thus defining MSY as a three-dimensional target space rather than a single value. In the course of the negotiations on the first Baltic MAP, the task force subsequently requested ICES to provide F ranges compatible with obtaining no less than 95% of the estimated maximum yield or catch[31] – an approach comparable to the US-American concept of "optimal yield"[32] or "pretty good yield"[33,34]. Scientists at ICES were asked to take into account the very nature of the MSY target when phrasing their advice for a computation of "F", since the latter is not a fixed value but one that fluctuates around the maximum value. Thereupon, ICES proposed F ranges, as a flexible fishing pressure response to changes in stock status, in an attempt to define a precautionary radius around set management targets.

28 *PEW Environmental Trusts (2016).*
29 *ICES (2018).*
30 *STECF (2015b).*
31 *ICES (2015d).*
32 *Patrick, W. S. & Link, J. S. (2015).*
33 *Hilborn, R. (2010).*
34 *Rindorf, A. et al. (2016).*

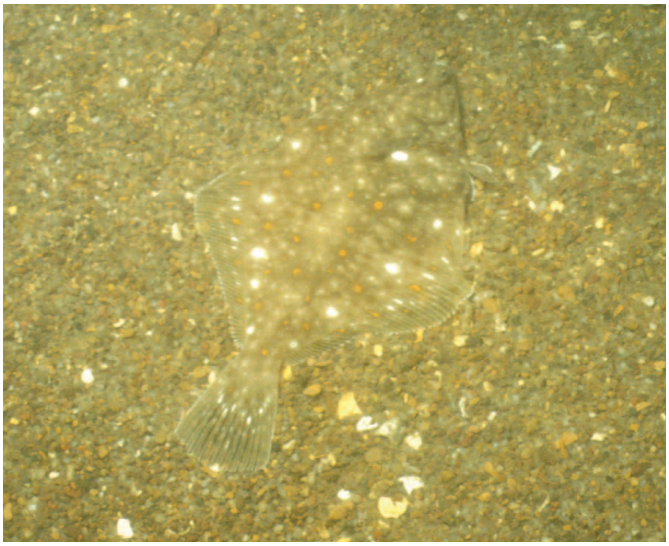
To this end, ICES established two reference points, marking out a F range defined by high yield on the one hand and low risk of depletion on the other – $F_{MSY\text{-}lower}$ and FMSY-upper[35]–, with FMYS is lying between the lowest and the highest F. Rainer Froese of GEOMAR in Kiel has voiced his concern that while the ranges between F_{lower} and F_{MSY} are generally unproblematic, those above F_{MSY} are not, even though ICES (bound by its political assignment) classifies them as "precautionary".

ICES does explicitly recommend for any ranges above F_{MSY} to be utilised cautiously, listing their potential negative consequences:

- **A need for increased fishing effort;**
- **Increased variability on catch opportunities and higher dependence of yield on recruiting year classes;**
- **The size of the fish in the stock and the catch will be smaller on average;**
- **Greater probability of SSB being less than MSY $B_{trigger}$.**

Moreover, where the fishing mortality F is set above F_{MSY} stocks are unable to reach the required population size above B_{MSY} necessary to produce MSY, which must be considered a blatant violation of the CFP.

Although it is true that current multi-annual/multi-species plans and the Harvest Control Rules they set forth pose little risk for affected stocks, they fail to fully reflect the objectives of the CFP by accepting F ranges above F_{MSY}. A study by Ulrich et al. (2017) found that if the target fishing mortality is set at $F_{MSY\text{-}upper}$, there is a risk of more than 5 % for plaithe and saithe stocks to fall below B_{lim} by 2020. For both these stocks, the probability of falling below MSY-$B_{trigger}$ by 2020 is around 40 %.[36] This leads to increased variability in annual fishing opportunities, including frequent TAC reductions to rebuild stocks, and increases dependence on the biomass of future recruitments.



Plaithe (Pleuronectes platessa), Sylt Outer Reef, German North Sea

The Basic Regulation of the CFP declares MSY its primary objective. At the same time, mixed fisheries and ecosystem components shall be given special consideration (Art. 9 of the CFP Basic Regulation). Particular attention must therefore be paid to mixed fisheries in which stocks with potentially very diverse status are simultaneously exploited.

The concept of F_{MSY} ranges has drawn strong criticism from nature conservationists.[37] While it does offer clear precautionary limits for political negotiations under the CFP, any range for F explicitly designed to form a part of operational management carries the risk of managers and relevant stakeholders systematically, and frivolously, opting for TAC margins at the top end of such range. It is a strategy that may occasionally help reach short-term economic targets, but that may also, in mixed fisheries, be used to deviate from TACs for stocks subject to particularly high fishing pressure by setting the relevant thresholds at the top end of F_{MSY} range. This could lead to a sustained increase in fishing pressure for all affected stocks, combined with slower recovery and delayed target achievement especially for the stock with the lowest productivity. As the example of cod in the North Sea shows, this will often be the stock that blocks fishing of other species (hence the term choke species).

35 *ICES (2016).*

36 *Ulrich et al. (2017).*

37 *Joint NGO recommendations on Baltic Sea fishing opportunities for 2019.*

Catched cod (Gadus morhua)

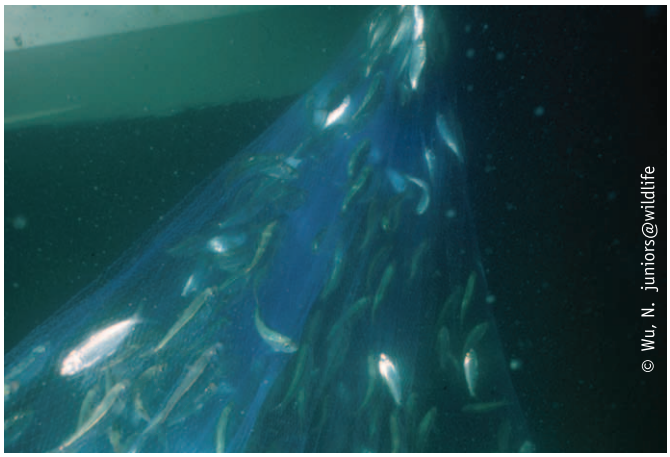
Clara Ulrich and her co-authors have shown that constant fishing pressure at the top end of the defined range may indeed carry an unacceptable level of risk. In its report on the economic impact of mixed fisheries options, SETCF has modelled the yield patterns of several stocks for both the "F_{MSY}" and the "$F_{MSY\text{-}upper}$" option: In all cases, it took only three years for "F_{MSY}" yields to surpass "$F_{MSY\text{-}upper}$" yields.[38] The resulting imbalance is long-lasting: Any problems caused by F_{MSY} as reference point, such as discards, would continue to exist and be further aggravated by low biomass and increased fishing intensity, resulting in long-term damage to the ecosystem and only a slight increase in catches.

Clearly, it is the EU Commission's and the Ministers Council's political responsibility to keep fishing activities within sustainable limits. Yet in its communication to the Council and the European Parliament on the state of play of the Common Fisheries Policy and consultation on the fishing opportunities for 2019, the Commission no longer formulates its position exclusively on the basis of scientific advice but makes reference to a number of other consultations it shall make when drafting its proposal on fishing opportunities.[39] Such "other consultations" were expressly taken into account in the Baltic MAP, although it remains unclear just who was consulted - possibly STECF, or the Baltic Sea Advisory Council. Not only does this line of action lead to even less transparency in the process of setting TACs: At a time of slower stock recovery, it seems rather questionable whether diversification of advice can promote timely achievement of the CFP objectives.

2.6 Putting science to the test: Complex nature vs. policy advice

Every year, the EU Commission prepares new requests to the International Council for the Exploration of the Sea (ICES) to be contractually agreed in a Memorandum of Understanding (MoU). These MoUs mainly concern annual publications such as updates on stock assessment and advice on fishing quotas which, combined with management scenarios, serve as a guideline in the political decision-making process.

A particularly drastic case is the 2018 ICES advice on Western Baltic herring, for which ICES now recommends a zero TAC for 2019 – clearly an indication of the considerable pressure science is under to justify its actions. In 2018, after ICES had reassessed the applicable reference points for herring as part of its standard review of all input data and models used ("benchmarks"), B_{lim} and MSY $B_{trigger}$ were significantly raised. As a result, the stock was now regarded as being "below B_{lim}".[40] In contrast to past assessments, recruitment at SSB <120,000 tonnes was newly considered to be compromised and recruitment in 2016 and 2017 deemed to have been not only below average but the weakest in the time-series. Under such circumstances, ICES is expected to advise a pause in fishing, provided no catch limits can be deduced that would guarantee achievement of the MSY objective within one year (although the ICES communication clearly notes that even a complete ban on herring fishing is no guarantee).



Catch of herrings (Clupea harengus)

38 STECF (2018).
39 European Commission (2018).
40 ICES (2018a).

Such readjustments obviously have far-reaching consequences for the fishing sector. In the case at hand, negative stock assessments cause not only a loss of earnings but also a suspension of the stock's certification, for which stock status is one of three assessment criteria. Major changes in scientific assessment have repercussions even beyond fishing practice. They have an external effect, too, negatively impacting confidence in science institutions and the models they use. Christopher Zimmermann, Director of the Thünen Institute for Baltic Fisheries, hence suggests that in the event of future model changes, there should be an agreed period of time during which two assessment models can run parallel before one is selected. He believes that immediate replacement of one model by another undermines credibility. It needs to be further examined whether scientists should perhaps be given more leeway in their advice to be able to adequately respond to this type of situation.

The EU Commission's recent publication of a public tender for scientific advice on fisheries worth around 10 million euros is currently causing scientists serious headache.[41] Subject of the tender is a flexible tool for providing scientific expertise to the European Commission on topics on which established advisory institutions such as ICES and STECF cannot provide advice, or cannot do so within a reasonable period of time, in relation to the North Sea and Baltic Sea marine areas as well as to European waters in peripheral areas and in the western Atlantic. The problem is that the institutions that may be interested in this kind of assignment are staffed with the same scientists that form ICES committees and workgroups, which might trigger a conflict of interest that in some cases may require drastic measures: **Outgoing ICES President Cornelius Hammer emphasises that all experts have a duty to be free of conflicts of interest and may therefore need to be excluded from ICES workgroups for the duration of their institute's contract with the Commission**. Hammer argues that in order to prevent this, and to safeguard the requisite quality monitoring of the newly proposed advice tool, intense discussions between the heads of institutions of several EU countries will be necessary. Together, they have now submitted a proposal to the Commission and EASME as implementing agency on how ICES processes can be maintained within the framework of the tendered assignments. As things stand today (28 Sep 2018), a final decision by the Commission is still pending.

41 *See: https://ted.europa.eu/udl?uri=TED:NOTICE:281154-2018:TEXT:EN:HTML*

2.7 Why are data-poor stocks exploited?

A major point of criticism levelled at the EU's user-driven fisheries policy has always been that it permits the exploitation of stocks for which only insufficient data for assessment is available. Even today there is not enough data for the majority of stocks fished in EU waters:

In its CFP progress report, STECF notes that in 2017, out of the 156 TACs in place for 66 stocks*, a mere 51 % were based on a reference point F_{MSY}, and only 43 % of TACs were covered by an estimate of the precautionary reference point B_{pa}.[42] Given this large data deficit, it is not surprising that a particularly high number of computations are lacking regarding the target state of "biomass at the level of MSY (B_{MSY})", making it virtually impossible to identify progress towards the CFP objective.

In the coming years, ICES will calculate the necessary reference points for a much larger number of data-deficient stocks. Specifications for MSY $B_{trigger}$ are currently being changed in such a way that a good proxy for B_{MSY} is obtained. This is required for 40 out of 69 stocks for which MSY $B_{trigger}$ is currently still at the level of B_{pa}.

In 2017, the EU Commission noted that recovery of data-poor stocks had generally slowed down and biomass of exploited stocks in the Mediterranean Sea had declined by 20 % from 2003 until 2014.[43]

Today, around 19 % of fishing opportunities across the EU are granted for stocks outside safe biological limits (11 %) or based on the precautionary approach, i.e., for stocks whose status in relation to the management objective of MSY is still unknown (8 %). Against the background of the above-referenced analysis by Hilborn & Ovando (see 2.4), it becomes clear that EU fisheries management must free itself from this dilemma: If data poverty arises from comparatively low commercial interest (exceptions confirm the rule) and scientific analysis is linked to economic interest, the drift between "well-assessed" and "data-poor" widens and an ecosystem-based approach remains wishful thinking.

42 *STECF (2018).*

43 *European Commission (2017).*

* *Note: The number of TACs is higher than the number of stocks because fishing for a stock may take place in several geographical regions and a stock's area of distribution may generally extend across several TAC areas as defined by ICES.*

3. Political decision-making

3.1 How many TACs have fisheries ministers set higher than scientific advice?

„Taking stock“, the 2017 report by fisheries consultants group Poseidon prepared at the request of PEW Environment Group, found that more than half of all TACs were set above scientific advice (with ICES advising on the basis of either the MSY approach or the B_{pa} approach, depending on the given data situation). The only improvement noted was a decrease in total excess tonnage compared to previous years. Nevertheless, every decision to allow catches above sustainable limits contravenes the CFP targets and undermines timely stock recovery. On average, between 2011 and 2015, fisheries ministers allowed for 20 % more fish to be taken than scientifically advised[44]. In terms of catch increases measured in tonnes, the UK and Denmark in particular have benefited, while Spain and Portugal, based on the percentage rise in their TACs, received the largest TAC increase.[45]

Fig. 4 shows the politically agreed increase from 2013 to 2017: **In 2017, the permitted excess TAC for all species totalled 240,742 tonnes of fish – after all, a reduction of 61 % compared to 2016, when a tonnage totalling 621,157 tonnes in excess of scientific advice was agreed.**[46]

It is generally accepted that the main reason for these deviations is the fact that scientific assessments take into account biological and ecological factors while policymakers place more emphasis on socio-economic considerations. In their analysis of “Political overfishing“, Voss et al.[47] have established that the political decision to exceed scientific advice may be heavily influenced by socio-economic aspects: In the period 1897–2013, TACs for the “Bay of Biscay“ region were set on average 164 % higher than scientific advice, whereas the Baltic appeared to be the ICES region with the lowest deviations during that same period. Yet if only the three economically most important stocks within each eco-region were compared, and key economic parameters such as employment rates, economic growth, and fish consumption factored in, a different picture emerged, with the highest deviations now being found in the Baltic and the Bay of Biscay only ranking second.

Besides such “legalised overfishing“ backed by ministerial decision-making, the lack of rigorous control measures accompanying maximum catch limits presents another problem. In early 2017, the German Federal Government noted in response to the question of whether it intended to implement additional fisheries monitoring to combat catches in excess of the politically agreed quotas for cod in the Western Baltic: “The Federal Government regards the existing control system as sufficient and sees no further need for additional at-sea monitoring. For that matter, one of the reasons why the Federal

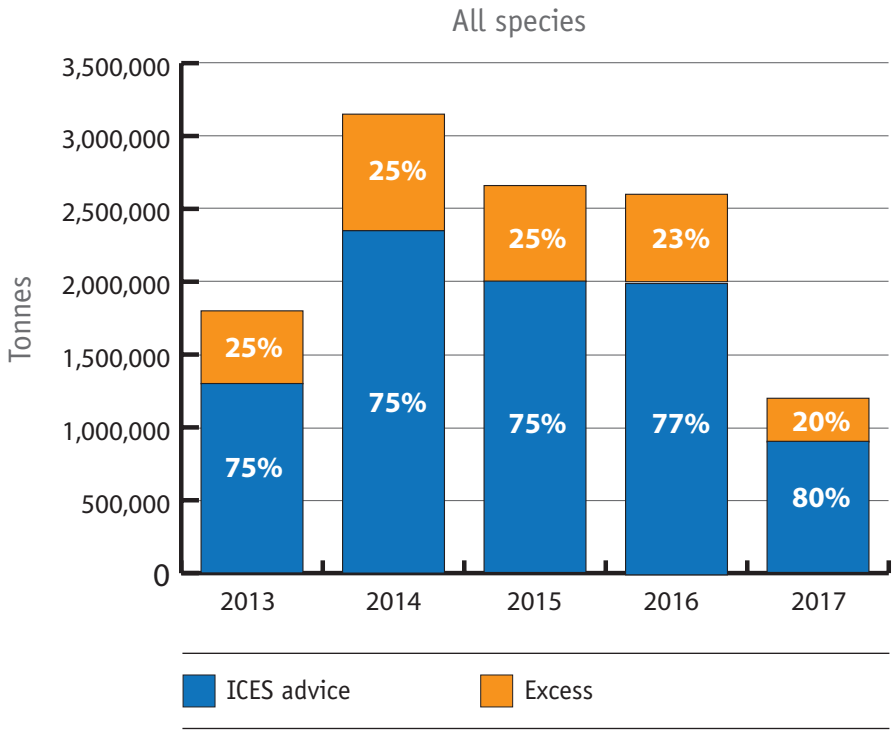


Fig. 4: Catches according to scientific advice (blue) and percentage of excess TAC (orange) for all stocks in the ICES area between 2013 and 2017. Source: Poseidon (2017).

44 *Carpenter, G. et al. (2016).*
45 *Ibid.*
46 *Poseidon (2017).*
47 *Voss, R. et al. (2015).*

YEAR 2015	Total fishing trips	Total controls	Percentage	YEAR 2016	Total fishing trips	Total controls	Percentage
Baltic Sea	24.318	1.685	6,9	Baltic Sea	19.718	1.291	6,5
North Sea	./.	./.	./.	North Sea	13.243	288	2,2

Tab.2: Fishing trips in the North Sea and Baltic Sea monitored by German fisheries control in 2015 and 2016. Source: Deutscher Bundestag (2017).

Government deems further expansion of at-sea monitoring unnecessary is the fact that compliance with quotas is controlled immediately upon landing"[48]. Unfortunately, this is not entirely true. By definition, the term "total allowable catch" (TAC) in its original meaning was only ever used within the framework of the old CFP (as in Council Regulation No. 57/2011:[49] "For the purposes of this Regulation […] ‚total allowable catch' (TAC) means the quantity that can be taken and landed from each stock each year"). By contrast, in the new CFP, the definition of the term TAC has been adjusted[50] to now read: "'total allowable catch' (TAC) means (i) in fisheries subject to the landing obligation referred to in Article 15 of Regulation (EU) No 1380/2013, the quantity that can be caught from each stock each year, (ii) in all other fisheries, the quantity that can be landed from each stock each year". Consequently, it is no longer sufficient to just control landings in order to establish compliance with the statutory maximum catch limits.

In its Annual Report 2016[51], the German Fishery Association highlights that "the supervisory bodies [adopt] a risk-based approach based on scientific knowledge for effective distribution of their control efforts".

In fact, according to the Federal Government, in 2016 the control density was no more than 2.2 % for all fishing trips in the North Sea, and 6.5 % for all fishing trips in the Baltic Sea (Tab. 2).[52] If at-sea monitoring is taken in isolation, the numbers drop to just 0.7 % in the North Sea and 1.5 % in the Baltic. **The exact percentage is of interest in that Article 15(13) of the Basic Regulation provides that for "the purpose of monitoring compliance with the landing obligation, Member States shall ensure detailed and accurate documentation of all fishing trips and adequate capacity and means, such as observers, closed-circuit television (CCTV) and others.** In doing so, Member States shall respect the principle of efficiency and proportionality".[53]

Also, there are examples where TACs are not even fully exploited, as in the case of western Baltic cod during the past six years. In these instances, the politically negotiated maximum catch limits surpass the amounts fishermen would have harvested in an unlimited, "open access" fishery, meaning that the set quota are in fact higher than economically required. In such a case, the economic forces governing fishing efforts are the only points of orientation, while regulation of fishing activities through legally stipulated maximum catch limits loses its steering effect. This discrepancy was particularly pronounced throughout the last two years of the term of the old CFP:[54] **In 2012, a TAC of 21,300 tonnes was agreed but a tonnage of only 17,072 ultimately landed. In the following year, a TAC of 20,000 tonnes was agreed but a tonnage of merely 12,968 landed.** Even though there are a number of reasons why quotas are not fully exploited, the figures illustrate a fundamental imbalance between ecological and economic claims regarding the implementation of sustainable fisheries. While this problem has noticeably improved since introduction of the MSY requirements in fisheries management from 2014 and is much less common throughout the EU today, there seem to still be strong incentives to make fisheries regulation as pain-free as possible rather than implement successful medium-term recovery strategies.

3.2 Will the 2020 objective of Article 2.2 be reached?

Will it really be a political success if the majority of large stocks (which produce the largest yield and are the most important ecologically/economically) reach a level of B_{MSY} by 2020? How are stakeholders interpreting the maximalist wording of the CFP: Must all stocks reach the CFP objective, and can the 2020 objective actually be achieved at all? Some fisheries science representatives such as Mark Dickey-Collas from the ICES Secretariat believe that efforts must primarily focus on getting as close as possible to the set targets as there will always be stocks which will fail to reach B_{MSY} simply because ecology or biology get in the way.[55]

48 *Original quote: „Die Bundesregierung betrachtet das bestehende Kontrollsystem als ausreichend und sieht keinen zusätzlichen Bedarf an weiteren Kontrollen auf See. Im Übrigen hält die Bundesregierung eine Ausdehnung der Kontrollen auf See auch deshalb nicht für notwendig, weil die Einhaltung der Fangquoten bei der Anlandung unmittelbar überprüft wird". Deutscher Bundestag, German Parliament Document No. 18/10814, 11 Jan 2017.*

49 *European Union (2011).*

50 *See for example: European Union (2014).*

51 *Original quote: „[…] die Kontrollbehörden auf der Grundlage wissenschaftlicher Kenntnisse mit einem risikobasierten Ansatz zur effektiven Verteilung des Kontrollaufwandes [arbeiten]." Deutscher Fischereiverband e.V. (2017).*

52 *Deutscher Bundestag, German Parliament Document No. 18/10814, 11.01.2017.*

53 *European Union (2013).*

54 *ICES Advice (2018).*

55 *Mark Dickey-Collas on 21 February 2018 during an event organized by PEW Environment Group („Countdown to 2020").*

Catch of rays, Brittany/France

While this type of statement may offer a plausible interpretation of scientific facts, it sharply contrasts with the legal requirements of current fisheries policy. The wording of Article 2 of the Basic Regulation provides for clearly set tasks and limits for fisheries management. All measures, management plans, and ministerial decisions must imperatively help reach the agreed objective, with any deviation constituting a breach of legal obligations. It must be noted, in particular in the discussions on a determination of the fishing mortality F, that the reference point F_{MSY} is not the target value for fisheries management: Rather, in an international context, F_{MSY} appears to be the limit reference point as of which a stock may require conservation measures. **Therefore, if TACs are set at the level of F_{MSY}, the objective of maintaining stocks above B_{MSY} is deliberately abandoned[56].**

Some members of the EU Commission think that the period since 2014 has been too short to already identify trends in stock development and stock size potentially ascribable to political decision-making under the new CFP. They argue that the development must "be observed over a longer stretch of time", conceding, however, that they expect no quick trend reversal and see hardly any indication that things are generally improving.[57]

German bottom trawler

From today's perspective, a more detailed geographical analysis reveals a conflict unfolding within the EU: **What seems possible and necessary for fisheries management in the North (East) Atlantic and the Baltic Sea will remain completely unattainable for the Mediterranean during the same period. It was evident even at the time of the 2013 CFP reform that the situation of fisheries in the Mediterranean was highly problematic and that the 2020 objectives could at best set the direction for fisheries management in the region.**

From a legal point of view, in case the 2020 objectives are missed, individual Member States and/or the European Parliament can respond to this non-compliance by filing an action. It remains to be seen, following the elections in 2020, what political stance a new EU Parliament will adopt and whether it will be ready to take such a step. Moreover, it is still rather unclear what the legal basis for such an action is. Fisheries ministers' TAC decisions and their continued granting of maximum catch limits above scientific advice could be a basis. Yet while TACs are set for all exploited stocks, in some instances the relevant reference points for the MSY objective are not available, making it impossible to finally determine whether the CFP objective for a given stock is achieved or missed.

The STECF report underlines that the recent slope of the indicators for overfishing demonstrate that progress until 2016 has been too slow to allow all stocks to be maintained or restored to at least the precautionary B_{pa}[58]– and even less to be managed according to F_{MSY} – by 2020.

56 *Client Earth (2015).*

57 *Personal remark by a Commission representative.*

58 *STECF (2018).*

4. What additional measures are required to reach the CFP objectives?

4.1 Is greater democratisation of the TAC negotiations conceivable/desirable?

The Lisbon Treaty has resulted in more direct involvement of the EU Parliament in decision-making processes towards (and under) the CFP.[59] Additionally, the new CFP Basic Regulation has provided for more scope for consultation of (regional) Advisory Councils (ACs) – including various stakeholders – in the context of, e.g., regional cooperation on conservation measures (see Articles 18 and 44 of the CFP Basic Regulation). This was, among other things, intended to grant more powers to the fisheries sector, which is strongly represented in the ACs. Both measures were aimed at furthering the democratisation and regionalisation of decision-making processes. However, this broadening of competences has not extended to the setting of TACs.

This could be the reason why the hopes of Ulrike Rodust (rapporteur on the CFP reform in the EU Parliament) that the involvement of the EU Parliament as co-decision maker in the legislative process may put an end to the dominance of national interests in negotiations have not been fulfilled. Rodust bemoans the fact that as soon as the particular interests of their own fisheries or concrete measure design are at stake, Member States still have greater leverage (BaltFish/Scheveningen Group/Advisory Councils/Council of Ministers, personal conversation on 29 August 2018), as evidenced by, e.g., the debate on the Baltic and the North Sea MAPs and in particular the intense negotiations on a potential derogation from the landing obligation.

Thus, to date, greater involvement of the European Parliament and various stakeholders has not helped diffuse the dominance of short-term economic interests. One way to enhance consideration of stakeholders invested in the long-term reconciliation of ecological and economical aspects in TAC negotiations could be to open up the legal framework for an extension of the right of action. If individuals and stakeholders could file an action whenever quotas are adopted that fail to meet the CFP's (ecological) requirements, this could have a major steering and/or disciplining effect on the legislator. Today, such right of action is still strictly limited.[60]

59 *Markus, T., Salomon, M. (2012).*

60 *Markus, T. (2010).*

4.2 Does the landing obligation drive stock recovery?

The landing obligation was never conceived as a building block for achieving conservation goals by the policy makers. It does not even accelerate or improve progress towards the key MSY objective. By 2007, the EU Commission had already published a policy strategy paper on the elimination of discards in European fisheries.[61] This "discards regulation" never saw the light of day, although it was based on a good idea: to demand that fishers land their entire catches in port, with positive effects on scientific data management, the socio-economy, fisheries management, and last but not least, fish stocks, plus controlled promotion of selective fisheries as a very welcome side effect. Technically, the draft regulation was already a good example of results-oriented management featuring in-built controls.

At the time of the recent reform of the Common Fisheries Policy, the EU was strongly committed to creating regulatory harmony. When it came to designing the landing obligation – see Chapter 2 for details – this was hardly helpful as co-legislators ended up ignoring the fact that discards situations and appropriate reduction measures tend to vary substantially among EU fisheries (see 2.2 above). This led to not only a delay in implementation but also a series of derogations required to "flexibilize" the landing obligation: The political package eventually tied up under the reform was perforated so that its contents would not be too bulky. Thus, Article 15 of the Basic Regulation provides for derogations from one of the key building blocks of the new fisheries policy in the form of de minimis rules for continued general percentaged discard permits, and exceptions for species "for which scientific evidence demonstrates high survival rates"[62]. Another problem are the so-called "choke species" that can cause the closure of fisheries. Requests by the fishing industry to decree exceptions and special regulations in order to relax the requirements associated with the implementation of the landing obligation have led to statements by the German Fishery Association such as: "From a German perspective, it is already foreseeable that turbot, skates and rays in the North Sea as well as plaice in the Baltic Sea will cause insurmountable difficulties".[63] This statement conflicts with proposals made by a research team commissioned by the European Parliament which concluded as early as 2015 that Baltic plaice would not act as a choke species if a suitable management plan were drawn up[64], while a qualification as choke species is still under discussion for plaice in the North Sea.[65]

61 *EU Commission (2007).*

62 *Regulation (EU) No 1380/2013 of the European Parliament and of the Council on the Common Fisheries Policy.*

63 *Original quote: „Aus deutscher Sicht ist bereits jetzt absehbar, dass die Arten Steinbutt und Rochen in der Nordsee sowie Scholle in der Ostsee bisher unlösbare Probleme bereiten werden." Deutscher Fischereiverband (2017).*

64 *Zimmermann et al. (2015).*

65 *EU Parliament, PECH committee (2018).*

Plaice (Pleuronectes platessa) is discussed as choke species in the North Sea

Moreover, the discussions during the annual TAC negotiations show that any problems encountered in implementing the landing obligation are invariably used as an argument to push quota top-ups, even though it remains unclear whether enough, and sufficiently reliable, data on discards in the relevant fisheries is available to use as a basis for such top-ups.[66] Apart from the fact that quota top-ups are generally disputable as they must always be set in relation to a computed reference point, the current handling of the landing obligation could in fact mean that the opposite of its original aim – to reduce unwanted catches and, thus, fishing mortality – is achieved. It ultimately remains unclear what benefits, if any, fish stocks will derive from one of the key amendments to fisheries policy.

4.3 What other measures could help promote stock recovery?

There are generally few variables fisheries management can control to regulate the scope and intensity of fishing efforts. The level of "setting total allowable catches" as primary adjustment option has already been examined in detail. Another key factor for the positive development of fish stocks, besides a limitation of fishing pressure, is adequate habitat conditions. The ecosystem approach plays a particularly important role here.

A number of institutions including the OSPAR Commission and HELCOM have conducted research into the ecosystem approach to the management of human activities.[67] In 2003, the Food and Agriculture Organisation of the United Nations (FAO) published a report on the ecosystem approach in fisheries management[68], thereby introducing the term "ecosystem" into fisheries management at the highest political level.[69]

Since then, the perspective has been firmly embedded in many national and regional legislations.

The European Common Fisheries Policy, too, adopted the approach, with the CFP Basic Regulation providing for the integration of the ecosystem approach into fisheries management with the aim of minimizing negative impacts of fishing activities on the marine ecosystem (see Article 2 Section 3 and Article 9 Section 5 of the CFP Basic Regulation). The ICES workgroup WGECO has been researching the ecosystem effects of fishing activities since the early 1990s.[70] And yet today's European fisheries management still fails to adequately reflect ecosystem correlations.

It takes political will and sufficient data on the marine ecosystems to put the ecosystem approach into practice. A good data base will include information on all levels of the foodweb, abiotic factors such as temperature and salinity profiles, the effects of fishing activities on communities, as well as the impact of climate change on the marine environment.[71] Two different aspects of the approach need to be distinguished: On the one hand, stock management must take into account ecosystem factors such as primary production and predation pressure that affect stock development.[72] On the other hand, ecosystems must wherever possible be protected from the impacts of fishing activities. This requires urgent introduction of eco-friendly fishing techniques[73], the creation of marine reserves, and full implementation of the Marine Strategy Framework Directive MSFD. Ecosystem-based management of biological resources will also raise the question of what type of conservation objective a stock shall reach. According to fisheries expert Prof. Christian Möllmann, if the objective is to, e.g., ensure "healthy stocks" as set forth under the MSFD (see descriptor 3), "western Baltic cod fisheries would need to close today" – even if cod stocks (as many others, too) have proven to be surprisingly resistant to the continued high fishing pressure. Years of severe overfishing have greatly altered the composition of cod stocks, whose age and size structures have long ceased to reflect the stocks' natural state.[74] What's more, economically, western Baltic cod fisheries are on the brink of ruin. In the absence of political will to change this situation, says Möllmann, economic collapse may in fact be the only way to trigger positive change for cod stocks.

In summary, the process of implementing an ecosystem approach in European fisheries policy is far from being complete and considerable efforts are still required.

66 *Client Earth (2016).*
67 *OSPAR Commission (2003).*
68 *FAO Fisheries Department (2003).*
69 *Probst, N.W. (2013).*
70 *ICES (undated).*
71 *Möllmann, C. et al. (2014).*
72 *ICES (2018).*
73 *Institut für Ostseefischerei (undated).*
74 *HELCOM (2018).*

Reef with Mussels (Mytilus edulis), serrated wrack (Fucus serratus) and European eelpout (Zoarces viviparous), Kadet Trench, Baltic Sea

5. Conclusion

Swift action required

Clearly, a lot still needs to be done in order to achieve the set targets. Many European fish stocks with a long history of overfishing continue to be overexploited. The rate of stock recovery and rebuilding is still unacceptably slow. As things stand today, full implementation of the regulatory framework designed to ensure achievement of the officially agreed objectives is still sorely lacking.

Fast and significant reductions in fishing pressure are necessary for overfished stocks to be able to quickly recover to the target level and to perform their important role in the ecosystems and marine foodwebs.

What must not happen vs. what needs to happen

For decades, EU fisheries management was primarily geared towards avoiding undesirable conditions ("What must not happen?"). Buffers were introduced to safeguard the target state and accommodate any uncertainties arising from the fixing of highly variable parameters such as fish stock biomass. With the adoption of the MSY management objective, fisheries management is now shifting towards taking appropriate measures to optimize fisheries and, thus, their yields. This includes the definition of target reference points ("What needs to happen?"), e.g. for stock size, to map productivity.

This realignment of the management system needs to be accompanied by a general rethink on the part of political decisionmakers. It is urgently required that policymakers truly understand the new system of reference points. So far, they seem to have a poor grasp of this novel concept: For example, "MSY $B_{trigger}$" was defined as substitute reference point for the target reference point B_{MSY} and hence as the level beyond which stricter measures such as reductions in fishing pressure need to be adopted. From a management perspective, this means that a reaction is triggered once a stock drops below the set target reference point. However, since MSY $B_{trigger}$ is below B_{MSY}, there is a risk that policymakers will rate MSY $B_{trigger}$ "good enough" even though it only marks the lower end of the set objective. Hence, "B" needs to urgently remain part of the debate in order to prevent that the mere minimum target is deemed acceptable and indeed sufficient.

If F_{MSY} is to be kept as primary reference point in the determination of TACs for individual stocks, policymakers need to be aware that "ranges" must only ever be used as short-term, flexible buffer zones, e.g., to balance annual variations in TACs, or to increase compliance and monitoring – although these positive effects still need to be verified.

The role of policy

In its communication on the fishing opportunities for 2019, the EU Commission has proposed yet another way to rate stock recovery[75]: For particularly small stocks that are exploited as bycatch only and whose economic importance is low, the Commission is considering establishing a new assessment approach – apparently because catch limits for such stocks can trigger choke situations for the more economically significant target fisheries. If this idea is put into practice, there is a risk that the CFP objectives will be deviated from and stocks of low economic importance may be overfished regardless of their potentially crucial habitat functions.

In the face of this trend, from a conservation and environmental perspective, policymakers at national and at EU level must make sure that scientific advice is never instrumentalized or called into doubt. At the same time, policymakers are urged to make every effort to remedy the present shortcomings in implementing the CFP and its complementary rules and take appropriate action to ensure timely achievement of the CFP objectives.

Last but not least, in the future, the specific focus of any ICES advice mandated by political decisionmakers will need to be closely scrutinized. Policymakers can and must guarantee the autonomy of scientific advice and ensure that ICES is not reduced to just confirming what policymakers want to hear.

75 *EU Commission (2018).*

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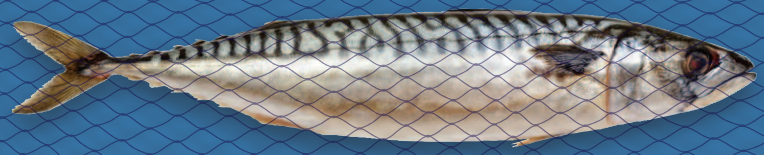
CHAPTER 2 | INTEGRATING NATURE CONSERVATION ASPECTS INTO THE CFP BASIC REGULATION



Dr. Nina Wolff

Author

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CHAPTER 2 | INTEGRATING NATURE CONSERVATION ASPECTS INTO THE CFP BASIC REGULATION

1. The scope of the CFP's environmental integration mandate

1.1 The CFP's origin in agricultural policy

To this day, the origin of the Common Fisheries Policy (CFP) as an offshoot of the Common Agricultural Policy (CAP) is reflected in the way policy objectives are prioritized. Even after the CFP was recognized as an independent EU policy in the Maastricht Treaty (1992) and primary law expressly identified „the conservation of marine biological resources" as one of the EU's exclusive competencies in the Lisbon Treaty (2007, Article 3(1) of the TFEU), the objectives of the CAP were not adapted to the particular requirements of the CFP or extended to include them. A separate primary-law catalogue of objectives specifically tailored to the CFP is lacking even today. Hence, under primary law, the CFP remains essentially committed to the predominantly socioeconomic objectives of the GAP, such as to increase productivity, to ensure a fair standard of living for coastal communities, and to provide consumers with food at reasonable prices.

Without abandoning its roots in agricultural policy as regulated in primary law, a separate set of objectives was developed for the CFP – at secondary-law level – from 1983, through four consecutive Basic Regulations with a ten-year term each. These regulations have served to gradually establish a comprehensive framework for the conservation and sustainable exploitation of fisheries resources in the EU. Initially mainly driven by use-oriented considerations in line with the objectives of the GAP, the focus of the CFP has since shifted to its law-making mandate, integrating environmental protection and nature conservation aspects.

1.2 Integration of environmental issues as law-making mandate

The main environmental impetus for the CFP came in the 1990s with the introduction of the so-called integration principle requiring that environmental issues be considered in all EU policies. Following the establishment of a horizontal clause regarding environmental protection as a principle of EU policy (Article 11 of the TFEU) in the Amsterdam Treaty (1997), the objective of the CFP under primary law was extended to include a – rather abstract – environmental objective: Environmental protection requirements must be integrated into the definition and implementation of the Common Fisheries Policy and fisheries governance, with a particular view to promoting sustainable development.

The environmental integration obligation aims to ensure that Union policies are consistent with safeguarding the livelihood of future generations. **Yet while it serves to secure the environmental focus of the CFP, it does not go so far as to require that environmental protection be given priority over fishing when adopting a new Basic Regulation of the CFP or other secondary legislation. Rather, EU institutions and Member States continue to enjoy great legislative freedom in this regard.**[1]

Moreover, the horizontal clause also affects the way secondary legislation governing environmental issues can be adopted under the CFP. The European Court of Justice has made it clear in various rulings that it is generally feasible to co-regulate nature conservation issues under other sectoral policies.[2] **Accordingly, environmental issues may be regulated under the CFP as long as the emphasis of the relevant secondary legislative act is on the conservation of marine biological resources. However, in order to prevent the co-regulation of environmental protection under the CFP ever leading to a thwarting of environmental protection requirements, it must at all times be applied with the aim of creating a high level of protection in line with the environmental objectives of Article 191 of the Treaty on the Functioning of the European Union (TFEU).**

1 *Calliess, C. & Ruffert, M. (2016).*

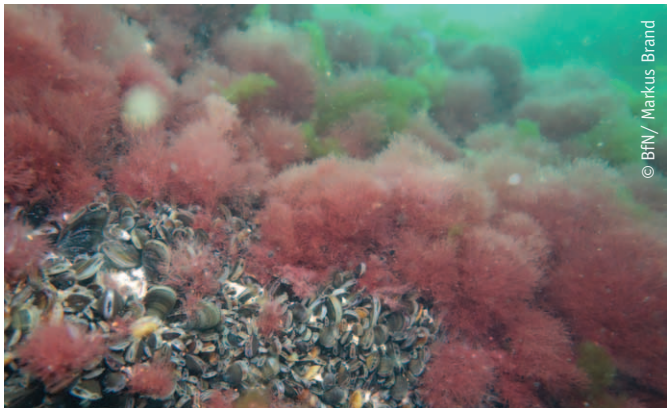
2 *Such as in the Mondiet case, ECJ, Case C-405/92 [1993], 1-6133.*

CFP Objectives	Sustainable Exploitation	Environment/Nature Conservation
1983 **(EEG) 170/83, Article 1**	conservation of the biological resources of the sea and their balanced exploitation on a lasting basis and in appropriate economic and social conditions	protection of fishing grounds
1992 **(EEG) 3760/92, Article 2**	to protect and conserve available and accessible living marine aquatic resources, and to provide for rational and responsible exploitation on a sustainable basis, in appropriate economic and social conditions for the sector	taking account of its implications for the marine eco-system
2002 **(EG) 2371/2002, Article 2**	exploitation of living aquatic resources that provides sustainable economic, environmental and social conditions to provide for sustainable exploitation of living aquatic resources	(…) to protect and conserve living aquatic resources (…) and to minimise the impact of fishing activities on marine eco-systems
2013 **(EU) 1380/2013, Article 2**	[environmentally sustainable in the long-term] (…) and managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and of contributing to the availability of food supplies	environmentally sustainable in the long-term application of the precautionary approach to fisheries management ensure that negative impacts of fishing activities on the marine ecosystem are minimised ensure that aquaculture and fisheries activities avoid the degradation of the marine environment

Tab. 1: Development of the environmental objectives of the CFP[3]

1.3 Ecosystem management as an objective of the reformed CFP

The environmental objective of the CFP includes the goal „to ensure that negative impacts of fishing activities on the marine ecosystem are minimised" (Article 2(3) of the CFP). However, the requirement to „endeavour to ensure that aquaculture and fisheries activities avoid the degradation of the marine environment" is defined as a mere obligation of effort. **There is no binding legislative target in the sense of, e.g., an optimization order.** Accordingly, the CFP continues to accept a possible deterioration of the marine environment due to fishing activities, provided such negative impacts are reduced to a minimum, leaving it unclear who is responsible for minimising the negative impacts of fishing and just how far the duty to minimise extends.



Reef overgrown by red algae, Baltic Sea

The conceptual framework of the CFP's ecological responsibility is an „ecosystem-based approach to fisheries management" – a highly complex approach that seeks to safeguard the composition, structure and functioning of the habitats of the ecosystem affected by preserving their biological wealth and biological processes (Article 4(1)(9) of the CFP). The CFP's ambition is therefore nothing less than to manage biodiversity. To fulfill this ambition, an integrated approach to fisheries management would need to be

3 *Modelled on: Goti-Aralucea et al. (2018).*

developed that would not only set reasonable ecological limits for fishing activities but also take into account the impact of other ecosystem components (species, habitats) and cover other human activities besides fishing. To date, the secondary legislation subsequently adopted on the basis of the 2013 CFP Basic Regulation has shown no indication of implementing such a far-reaching strategy in combination with a precautionary approach for the various ecosystem components. Similarly, none of the regional multi-annual plans prepared to date have served to advance such a comprehensive concept.

A look at the two important regional seas for German fisheries, the North Sea and the Baltic Sea, and their very different ecological conditions clearly shows the extent to which implementation of an integrated ecosystem-based approach would depend on nuanced analysis: The Baltic Sea, which due to its hydrographic composition is a particularly vulnerable brackish inland sea featuring a comparatively low variety of species, places different demands on integrated management compared to the ecosystem of the North Sea which, being richer in structure and biodiversity, is not only much more complex but also under substantially more commercial pressure. Current management plans for individual marine areas and stocks focus on the management of commercial fish stocks and fail to consider non-target species and other ecosystem components.

Reef densely populated by light bulb tunicate (Clavelina lepadiformis), Sylt Outer Reef, German North Sea

2. Regionalisation: A chance for ecosystem-based fisheries management

2.1 Directing detail queries to the regional level

Since the EU's environmental legislation under primary law – accommodating the realities of different Member States and regions within the EU – already includes the concept of regional differentiation as a principle of action, regionalisation of decision-making was one of the main goals of the CFP reform.

Under the reformed CFP, in an attempt to increase effectivity and compliance, fisheries measures were to be adapted to the characteristics of individual fisheries and regions. The diagnosis preceding the CFP reform[4] had in fact revealed a number of weaknesses in the technical measures previously taken at EU level, including

» overly general rules that fail to reflect the specific circumstances of individual fisheries and therefore failed to fulfil their purpose;

» a type of governance that through detailed top-down decision-making caused an unacceptably high degree of regulation full of inconsistencies.

From a nature conservation perspective, the decision to regionalise parts of the CFP was a major step in the direction set by the Convention on Biological Diversity (CBD), according to which decentralization of management to the lowest level feasible is one of the guiding principles for the implementation of an ecosystem approach. Generally, it is regional rules that best serve specific conservation needs – for example, in the case of EU fisheries, the different demands posed by the unique ecosystems, species compositions, and fisheries characteristics of each marine area. Cultural differences between the various regional environmental and fisheries stakeholders may be another reason for differentiation.

As a result, the CFP lists „the taking into account of regional specificities, through a regionalised approach" as one principle of good governance (Article 3 of the CFP). This means that for some areas, the CFP only provides a framework for action consisting of targets and measures whose material design is then determined at a regional level.

Yet unlike in policy domains with shared responsibilities (such as environmental policy), within the scope of the CFP, regionalized conservation measures are adopted according to a process laid

4 *Cf. EU-Commission (2009).*

down in the Basic Regulation, which provides for measures to still be adopted not at regional or Member State level but at Union level based on regional recommendations. Under the principle of subsidiarity as stipulated by Union law[5], decision-making power is generally delegated to a „lower" entity, usually the Member States, whenever a proper decision can be taken at such lower level and the objectives of the proposed action cannot be better achieved at Union level. This principle does not apply to the CFP as an area of exclusive Union competence. In line with the idea of „better" governance as the basic concept behind the principle of subsidiarity, any results achieved by regional decision-making bodies mandated under the CFP will be gauged in terms of whether they create any added value compared to regulations designed centrally (by the Commission) – hence, whether it is convincingly demonstrated how a regional regime, taking into account specific regional circumstances, can effectively minimise the negative impacts of fishing activities.

2.2 Areas of regionalisation

For some regulatory areas, the CFP Basic Regulation explicitly refers to the regionalization process laid down under Article 18 of the CFP. In addition, it allows for the regional level to also be consulted regarding the contents of further measures.

In particular, multi-annual plans containing conservation measures as per Article 9 et seq. of the CFP, management measures under the Member States' nature conservation commitment as per Article 11 of the CFP, and discard plans including details of, and derogations from, the landing obligation in individual fisheries as per Article 15 of the CFP may become the subject of regional cooperation.

Moreover, besides these three cases of application provided for in the Basic Regulation, Member States having a direct management interest are given the opportunity to prepare joint recommendations for further regional conservation measures, potentially including any type of technical or spatial measures, regardless of whether they are required under the relevant regional multi-annual plan or not.

2.3 Process

Under the process stipulated under Article 18 of the Basic Regulation, Member States can submit joint recommendations for conservation measures defined at EU level, such as rules on mesh size or the regulation of fisheries in marine protected areas, amongst others. To this end, Member States are expected to cooperate at regional level and consult with Regional Advisory Councils. All Members States „having a direct management interest" are to be involved in the process, including those that either have fishing opportunities or generally fish in the relevant Exclusive Economic Zone (Article 4(1) of the CFP), and may subsequently submit a joint recommendation to the Commission.

As far as multi-annual plans or matters regarding the landing obligation are concerned, cooperation among Member States takes place within the framework of the regional bodies Baltfish (for the Baltic Sea) and Scheveningen Group (for the North Sea). However, the provisions of the CFP regulation fail to specify whether the term „Members States having a direct management interest" actually refers to these bodies, or rather to spontaneous, ad hoc groupings of Member States formed with a view to a specific regulatory subject.[6] To what extent other regional stakeholders such as fishery representatives, scientists or civil society associations are involved is at the discretion of these groups, although their participation is required under the principle of appropriate involvement of all stakeholders in the conception of CFP measures as enshrined in the Basic Regulation (Article 3(f) CFP). On a regional level, decisions on recommendations can only be taken with the votes of all Member States[7] involved – a requirement allowing each participating Member State to block negotiations of any proposal that may run counter to its own interests and push interest-driven minimal solutions instead of pertinent optimal ones.

Finally, the Commission is empowered to adopt delegated or implementing acts, which enter into force if no objection is expressed by either the Council of Ministers or the Parliament. Thus, all regionalisation measures ultimately remain a Union act. The Commission is also tasked with supporting the cooperation of Member States, e.g., by providing scientific advice.

5 *Cf. Article 5(3) of the TEU.*

6 *In more detail: Salomon, M. (2013).*

7 *See for example Article 3.1.10 of the BaltFish Memorandum of Understanding.*

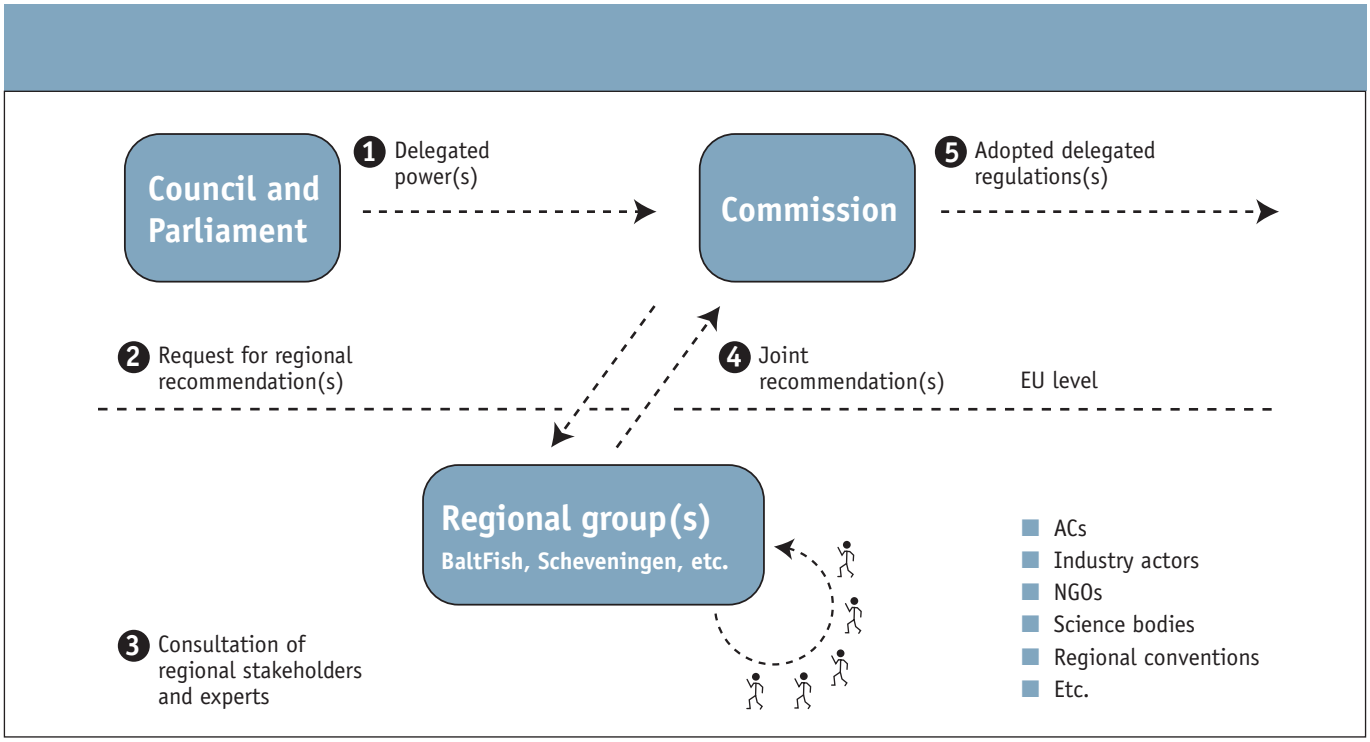


Fig. 1: The regionalisation process pursuant to Article 18 of the CFP [8]

2.4 Requirements for the contents of joint recommendations

The recommendations to be made by Member States are subject to a number of requirements (Article 18(5) of the CFP) that need to be cumulatively fulfilled. They call for little more than general compatibility with applicable Union fisheries law, demanding that recommendations

- be based on the best available scientific advice (already laid down as a principle of good governance under Article 3(c) of the CFP);
- be compatible with relevant conservation measures and multi-annual plans;
- be compatible with the objectives set out in Article 2, which include in particular application of the precautionary approach and an ecosystem-based approach, exploitation of stocks of the basis of maximum sustainable yield, and gradual elimination of discards;
- be compatible with the scope and objectives of the relevant conservation measures;
- be compatible with the scope and objectives of the relevant multi-annual plan;
- effectively meet the objectives and quantifiable targets set out in a relevant multi-annual plan;
- be at least as stringent as measures under Union law.

What is missing from this catalogue is substantive objectives and targets in the form of, e.g., a clear reference to regional factors or qualitative instructions analogous to EU policy on the environment, with the aim of achieving the highest possible level of protection.

Expert assessment:

On the positive side, despite the strict requirements under the TFEU, the rules on regionalisation laid down in the new CFP have helped create a prototype for cooperation below Union level[9] which has the potential to best bring the contents and subjects of regulations into congruence and serve as a potent medium in the ongoing process of achieving the CFP objectives. The established scheme recognizes the importance of regionalisation for the CFP and is a pioneering one, even if the process as set forth under the current Basic Regulation cannot be considered fully effective yet.[10]

On the other hand, the hope that the regionalisation of CFP measures would be accompanied by a dynamic implementation of the ecosystem approach on a regional level has not been fulfilled. This is because the relevant rules of the CFP merely permit regional cooperation among Member States without making it an obligation. Also, cooperation among Member States alone is

8 *See Eliasen, Q. et al. (2015).*

9 *Markus, T. & Salomon, M. (2013), p. 82*

10 *Cf. Penas Lado, E. (2016), p. 310 et seq.*

no guarantee for an ambitious implementation of the ecosystem approach, which would require a consensus among the Member States concerned that regional ecosystem considerations must take precedence over national economic interests. What seems to be lacking is confidence on the part of Member States that any concessions made to achieve objectives on a regional level will not weaken their own national position. In the absence of such confidence, there is a risk that solutions found through regional cooperation will primarily be based on the principle of the lowest common denominator.

Any such influence exerted by the regional level remains fundamentally limited since the submission of a joint recommendation does not obligate the Commission to adopt a corresponding measure, as stipulated by Article 18(3) of the CFP. Only rarely is Member States' failure to act at regional level remedied by the Commission's commensurate regulatory power – which is just that: a power, not a duty. Even following agreement among Member States and adoption of a delegated act by the Commission, the EU Parliament and the Council of Ministers can still express an objection.[11]

Given the EU's exclusive competence to take action under the CFP, it seems that a genuine shift of decision-making powers to the regional level continues to be impossible. For the time being, regionalisation therefore remains a work in progress.[12]

11 *Article 46 of the CFP Basic Regulation.*

12 *Argues Symes (2012).*

3. Technical measures as a means to regulate exploitation of stocks

The negative impacts of fishing activities on the marine ecosystems range from increased mortality of target and bycatch species, degradation of their habitats and altered population patterns, to indirect effects on associated species and their feeding relationships, to changes in the composition and diversity of ecosystems. Against this background, technical measures under the CFP shall regulate how, where, and when fishing may take place. By legal definition, technical measure means „a measure that regulates the composition of catches by species and size and the impacts on components of the ecosystems resulting from fishing activities by establishing conditions for the use and structure of fishing gear and restrictions on access to fishing areas" (Article 4(20) CFP). While the CFP gives no clear definition of „ecosystem components", it can be assumed, on the basis of the definition of „ecosystem-based approach to fisheries management" under Article 4 of the CFP Basic Regulation, that basically all biotic and abiotic factors may fall within the scope of technical measures – making the latter an effective tool for the implementation of the ecosystem approach as required under the CFP and the minimization of negative impacts on the marine environment.

Bycatch Baltic Sea

However, under the current CFP, ecosystem impacts are mainly defined as the effects of fishing on non-commercial species and on protected species such as marine mammals, seabirds or sea turtles (especially with a view to the problem of bycatches) or on marine habitats – while the potential negative impacts of the removal of large quantities of target fish on the marine ecosystem and its foodwebs are largely overlooked. One exception is the fisheries restricted area to the west of the coasts of England and Scotland established to protect sand eel abundance as the main food source for the local kittiwake population.[13]

Black-legged kittiwake (Rissa tridactyla)

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From the point of view of nature conservation, technical measures must ensure that any harmful interactions between fisheries and the affected marine ecosystem are fully regulated and minimised. Any such regulatory regime must pursue the objective of preserving all ecosystem components, including interdependencies within marine ecosystems and trophic structures, and be measured against the protection objectives of the relevant EU nature directives und the Marine Strategy Framework Directive.

The regional multi-annual plans for the Baltic Sea[14] and for the North Sea[15] adopted to date each contain a provision on technical measures mainly specifying the different categories such measures fall into. Contents-wise, these multi-annual plans don't go beyond the types of technical measures already listed under Article 7 of the Basic Regulation and thus offer no specific regional benefits. Rather, they remain limited to the compulsory minimum contents as set forth under Article 10 of the CFP without seizing the opportunity presented by the latter to lay down further operative conservation standards, such as to minimise the negative impact of fishing on the ecosystem (Article 10(2)(a)). No region-specific, quantitative, or qualitative targets have been set.

13 *Regulation 850/98, Article 29 a); see also F. Daunt et al. (2008).*

14 *Regulation 2016/1139, Multi-annual Pan for the Baltic Sea.*

15 *Regulation 2018/973, Multi-annual Plan for the North Sea.*

Bottom trawler

However, on 11 March 2016, the European Commission has submitted a proposal for the establishment of a new technical conservation measures framework.[16] The regulation aims at consolidating and simplifying more than 30 different legal acts in force today, including Council Regulation (EC) No 812/2014 of 26 April 2004 on laying down measures concerning incidental catches of cetaceans, and merge them into one coherent instrument for the regulation of fishing activities. The new legal framework shall support the objectives of the reformed CFP, in particular the MSY objective, but also its nature conservation efforts, by laying the foundation for flexible regional developments. At the time of writing, the pertaining legislative procedure is still in trilogue negotiations between the EU Commission, Parliament, and Council of Ministers.

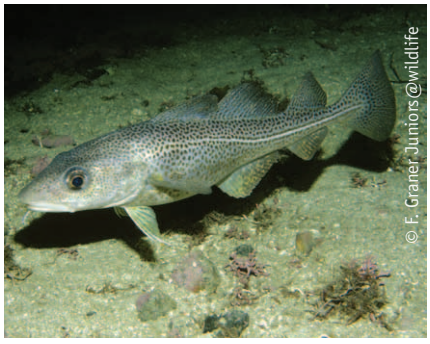
The Commission proposal is of paramount importance for the desired coherence between Union environmental legislation and fisheries legislation, proposing as it does a set of rules regarding sensitive species and habitats.[17] It maps out a new regulatory structure for the management and delegation of powers to develop regional solutions, comprising a set of general measures applicable to all sea basins plus a specific catalogue of baseline measures for each of the seven sea basins, tailored to their regional characteristics, including for the North Sea and the Baltic Sea. These baseline measures reflect the current acquis of technical rules.

Besides the regulatory objectives of simplification and regionalisation, the new regulatory framework for technical measures also aims to increase effectiveness. Listing the reasons for its proposal, the Commission attributes the lack of effectiveness of previous legal acts regulating technical measures to a lack of clearly defined metrics on which to measure success, amongst other things. Accordingly, the Commission proposal contained both qualitative and quantitative requirements for reducing bycatches of juveniles, marine mammals, reptiles and seabirds and for limiting the environmental impact of fishing activities on seabed habitats. Following a first reading of the draft law in the European Parliament, the initially proposed „targets" were replaced by so-called „selectivity performance indicators", to be established for each stock in line with scientific advice by ICES and STECF.[18]

Gray seal (Halichoerus grypus)

Northern gannet (Morus bassanus)

Long-tailed duck (Clangula hyemalis)



Codling on the seabed (Gadus morhua)

Harbour porpoise (Phocoena phocoena)

16 *EU-Commission (2016).*

17 *See Client Earth (2017).*

18 *Birdlife International et al. (2018).*

The overall structure of the proposed legal framework follows a graduated process in which all common rules are consolidated and then used as the foundation for regional solutions. Moreover, minimum standard measures are laid down for all sea basins, largely reflecting the status quo of EU secondary law:

General provisions (for **all** sea basins):	Scope, overarching and specific objectives, in combination with performance indicators designed to measure progress, etc.
Common technical measures (for **all** sea basins):	Cross-regional limitations/prohibitions of the use of certain types of fishing gear, common rules for the application of minimum conservation reference sizes, etc.
Principles for regionalisation (for **all** sea basins):	Establish the empowerments needed for regionalisation of technical measures, in particular under the umbrella of multi-annual plans.
Regional default measures for **individual** sea basins:	Annexes featuring default measures for individual sea basins (the North Sea, North Western waters, and Baltic Sea, amongst others) to be applied in case no further provisions are adopted at regional level, including minimum conservation reference sizes by species.

Tab. 2: Minimum standard measures for all sea basins

3.1 Targets for the properties and condition of fishing gear

Technical requirements for fishing gear shall positively impact the size composition and restoration of fish stock biomass. Further, gear regulation can help minimise unwanted catches or bycatches (of, e.g., marine mammals and seabirds) and negative impacts on seabed habitats. Rules on the properties and condition of fishing gear can be grouped into four categories:

1. **Measures that regulate the operation of the gear, including bans on certain types of gear:**
   The proposed Technical Measures Regulation comprises existing EU-wide bans on fishing methods such as the use of explosives or projectiles as well regional bans on the use of driftnets in the Baltic or beam trawls in the Kattegat. One highly controversial issue is the fact that the Commission qualifies pulse beam trawling as an innovative fishing method and proposes to permit its use in parts of the North Sea. While the European Parliament rejected this relaxation of the existing rules at first reading, a compromise may still be reached in the trialogue negotiations.

2. **Measures that regulate the design characteristics of the gears that are deployed:**
   The proposed legal framework provides for both generally applicable design specifications for trawlers and a number of regionally applicable rules on, e.g., mesh size for set net fisheries and bottom trawls.

3. **Definition of minimum conservation reference sizes for target species, resulting in requirements for the properties and condition of fishing nets:**
   Minimum conservation reference sizes should provide protection for juveniles and are separately defined for each sea basin.[19] Classification of species is not always consistent across sea basins[20]: For example, the minimum conservation reference size is 27 cm for North Sea plaice but only 25 cm for Baltic plaice.

4. **Measures that mitigate the impacts of fishing gears on sensitive species (including marine mammals, seabirds, and turtles) or the seabed:**
   The general provisions of the legal framework set forth a comprehensive prohibition on fishing for all species of fish, sea mammals, and seabirds that are critically endangered and/or endangered throughout the EU.[21] In order to protect vulnerable marine habitats/ecosystems, the use of certain types of fishing gear is prohibited in designated areas.

19 *See Penas Lado, E. (2016), p. 82 et seq.*

20 *This has been criticised in the legislative procedure: Birdlife International et al. (2018)*

21 *Pursuant to Annex IV of the FFH Directive.*

Flatfish catch with bottom trawling

The acquis of existing standards for a reduction of bycatches of cetaceans or seabirds was integrated into the Annexes featuring standard measures for each sea basin, such as the obligation to use deterrent devices for all vessels of 12 meters or over in overall length deploying static nets in the North Sea and the Baltic Sea. More far-reaching requirements – which are urgently needed from a nature conservation perspective, especially in the above example – still need to be developed on the regional level, separately for the North Sea and the Baltic Sea.

Further, as part of the landing obligation, the proposed legal framework prohibits harmful fishing practices such as highgrading or slipping, i.e., the intentional release of the catch before it is fully brought on board (See section 5 below).

3.2 Regulating access to fisheries

Besides adjusting fishing efforts, the EU and its Member States can use permanent or temporary closures of fishing areas as a means to achieve fisheries management or nature conservation objectives. In the context of fisheries management, catch limits are primarily designed to increase the selectivity of catches or minimise unwanted catches. Similar to developments in global marine nature conservation, in EU legislation, catch limits imposed for reasons of stock conservation preceded those adopted for the sake of nature conservation and initially clearly formed part of fisheries management. With the development of modern concepts of species and territorial protection, and in particular since establishing the notion of biological diversity as an object of protection in international and European law, the boundaries between resource conservation and nature conservation are blurring, as shown by the fact that commercial fish are included in marine biodiversity conservation measures, e.g., as part of implementation of the European Marine Strategy Framework Directive (MSFD).

Under the current CFP, fishing can be restricted or excluded where such measures serve to drive stock recovery and conservation, or preservation of the marine ecosystem. Depending on their exact objective and scope, the measures are defined under different sections of the reformed CFP, which provides for the following types of exclusions and closures:

Type of closure	Section of the CFP
Temporary or seasonal closures for the sake of stock conservation or due to ecosystem considerations	Article 7(2) CFP
Stock recovery areas due to their particular biological sensitivity, e.g., as spawning grounds or for the protection of juveniles.	Article 8 CFP
Closures to comply with Member States' obligations under environmental legislation	Article 11 CFP
Emergency measures in case of a serious threat to the conservation of marine biological resources or to the marine ecosystem	Article 12, 13 CFP
Real-time closure of select fisheries triggered by new information on stocks/catches (e.g., under regional management plans)	Article 7(2) CFP/ Article 51 et seq. of Control Regulation 1224/2009

Tab. 3: Available spatial measures for different conservation objectives under the CFP

The EU is empowered to take measures in response to temporary conservation needs, and to define permanent no-take zones, with the CFP thus covering the entire range of static, spatial management tools (cf. FAO 2011). However, in practice, not all of these tools are used: In particular the potential to rebuild stocks offered by Article 8 is not being sufficiently exploited.

Real-time closures as a conservation measure imposed to address the specific challenge of reducing undersized bycatches in line with the requirements of the landing obligation deserve a special mention. They represent a flexible means to geographically and seasonally tailor fishing bans to events that occur regularly but not identically periodically. Where fishing for select stocks can be temporarily diverted, permanent closure may be avoided, as shown by the system of real-time closures presently established in the North Sea and the Skagerrak by Norway in conjunction with the EU. The pertaining agreement entered into force on 1 September 2009 and offers the possibility to close fishing areas in the North Sea and the Skagerrak for the protection of juveniles.[22]

Increased use of this management tool would offer the chance to better reconcile potentially conflicting interests of fisheries and nature conservation by limiting permanent exclusions to the absolute minimum. However, since real-time closures are typically triggered by catch samples, landings, or self-declarations by fishermen, such data needs to be reliably collected and quickly made available to the competent authorities to be able to swiftly implement temporary prohibitions on fishing.

This notwithstanding, Member States may still at times be forced to comply with their nature conservation obligations under the CFP by establishing permanent no-take zones (See Section 4 below).

22 *Regulation 724/2010.*

4. Conservation measures as a means to meet environmental obligations (Article 11 of the CFP)

The objectives of secondary environmental law for the protection of fauna and flora also apply to marine areas under the sovereignty of the Member States. Accordingly, all obligations aimed at conserving and rebuilding marine habitats and preventing their deterioration imposed on Member States under the Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (FFH)[25], the Birds Directive[26], and, for the protection of marine areas, the Marine Strategy Framework Directive[27] also extend to Union waters within the scope of the CFP[28].

On the basis of powers delegated under secondary environmental law, Member States can impose temporal or spatial restrictions and even exclusions of individual uses – including fisheries exploitation – in these protected areas. Moreover, Member States are obliged to take appropriate measures for designated protected areas within six years.

In order to meet the requirements of the Nature Directives, in 2017, Germany placed the ten Natura 2000 sites, designated as early as 2004, under formal protection by way of six Protected Areas Regulations covering „Dogger Bank", „Borkum Riffgrund", and „Sylt Outer Reef – Eastern German Bight" in the North Sea, as well as „Fehmarn Belt", „Kadet Trench", and „Pomeranian Bay – Rönnebank" in the Baltic Sea.[29] Commercial fishing in these areas is still pending regulation subject to the provisions of Article 11 of the CFP. However, as will be shown below, the reformed CFP limits the regulatory power of Member States with regard to fishing activities.

In accordance with the directive character of the underlying secondary legislation, Member States should generally be free to decide on the most suitable ways and means to achieve the objectives of the directives, as long as their practical effect is preserved.[30] On the strength of the previously discussed horizontal clause regarding environmental protection (see 1.1.b above), the contents of the directives can and should also be integrated into the scope of secondary fisheries law, with European fisheries law contributing to the achievement of the directive's objectives. Under the reformed CFP, the legal structure of the right of Member States to adopt fisheries conservation measures in compliance with their nature conservation obligations is even fully incorporated into the Basic Regulation. Systematically, Article 11 of the CFP provides for different types of regulatory competence under two alternative scenarios of use:

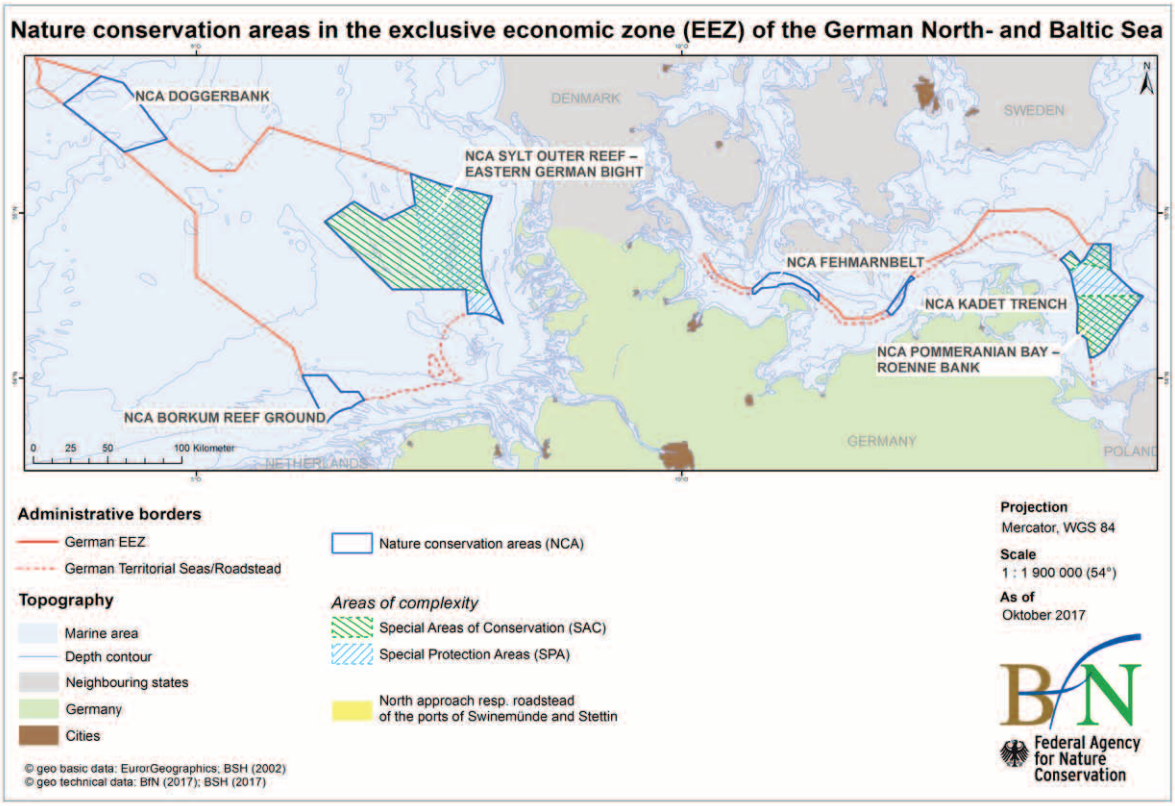


Fig.2: Nature conservation areas in the German North Sea and Baltic Sea EEZ. BfN (2017)

25 *Directive 92/43/EEC.*

26 *Directive 2009/147/EC.*

27 *Directive 2008/56/EC.*

28 *Waters under the sovereignty or jurisdiction of the Member States (Article 4(1) of the CFP).*

29 *BGBl. No. 63 of 27 September 2017, see also https://www.bfn.de/themen/meeresnaturschutz/nationale-meeresschutzgebiete.html.*

30 *Ruffert, M. in Calliess, C. & Ruffert, M. (2016).*

Article 11(1) of the CFP The proposed measure does not affect fishing vessels of other Member States	➔ Member States are empowered to adopt necessary conservation measures set out in Article 11(1) of the CFP under the additional legal conditions specified therein
Article 11(2) of the CFP The proposed measure affects other Member States that have a direct management interest in the fishery to be affected by the measure	➔ Initiating Member State has information and consultation duties vis-à-vis other affected Member States ➔ Initiating Member State and other affected Member States may submit a joint recommendation to the EU Commission within six months ➔ EU Commission is empowered to adopt the conservation measure within three months

Tab. 4: Regulatory competence of Member States regarding the implementation of conservation measures in protected areas pursuant to Article 11 of the CFP

Under the preamble of the CFP Basic Regulation, this distinction is summarized as follows:

"The obligations imposed on Member States as regards special protection areas, special areas of conservation and marine protected areas, respectively [...] might require the adoption of measures falling under the CFP. It is, therefore, appropriate to authorise Member States to adopt, in the waters under their sovereignty or jurisdiction, such conservation measures that are necessary to comply with their obligations under those Union acts where such measures do not affect the fisheries interests of other Member States. Where such measures might affect fisheries interests of other Member States, the power to adopt such measures should be granted to the Commission and recourse should be had to regional cooperation among the Member States concerned."

Arctic tern (Sterna paradisaea)

4.1 Unilateral Member State action pursuant to Article 11(1) of the CFP

The text of the regulation restricts unilateral Member State action and the use of national normative instruments to measures exclusively affecting fishing vessels that fly such Member State's flag and operate in waters under such Member State's sovereignty or jurisdiction. This right to unilaterally adopt conservation measures is subject to the three secondary-law environmental regulations listed under Article 11(1) of the CFP, which stipulate that action must be in the form of spatial measures pursuant to the Marine Strategy Framework Directive, measures for the conservation of habitats of bird species protected under the Birds Directive, or conservation measures for Natura 2000 sites.

National conservation measures are further subject to the following requirements laid down in Article 11(1) of the CFP and/or Article 2 of the FFH Directive as referenced in Article 11(1) of the CFP:

- The proposed measures meet the objectives of the relevant Union legislation that they intend to implement;
- They are necessary to achieve the set objectives;
- They are at least as stringent as measures under Union law;
- They are designed to maintain or restore the respective resource at favourable conservation status;
- They take account of economic, social and cultural requirements and regional and local characteristics.

The reason why the Member States' own national power to adopt fisheries conservation measures in compliance with obligations under Union environmental legislation is restricted by Article 11(1) of the CFP is the Union's exclusive responsibility for fisheries management (Article 6 of the CFP). **Accordingly, the power to manage fisheries belongs „fully and definitely to the Community" or Union.**[31] In areas of exclusive Union competence, legislating at national level requires express empowerment by the Union (Article 2(1) of the TFEU), i.e., a „redelegation"[32] of regulatory competence back to the Member States.

Under the reformed CFP Basic Regulation (Article 11(1)), such redelegation in terms of regulatory requirements regarding fishing activities in marine protected areas is strictly confined to situations that exclusively affect

1. only fishing vessels flying a Member State's own flag
2. AND only waters under such Member State's own sovereignty or jurisdiction.

It should be noted, however, that as far as such regulatory requirements relate to protected areas within the German EEZ, they invariably also affect the fishing vessels and fishing interests of other Member States. Often enough the fishing effort of other Member States is even far more intense than that of German fishing vessels.

Hence, Article 11(1) of the CFP does not apply to measures affecting fishing vessels flying the flag of another Member State, as the ECJ has stated in its judgment of June 2018.[33] This preliminary ruling procedure concerning the interpretation of Article 11 of the CFP essentially dealt with the question of whether the CFP Basic Regulation limits, and possibly even supersedes, the obligations of Member States to implement the FFH Directive.[34] The ECJ confirmed this with reference to Article 11(1) of the CFP which conclusively governs the delegation of power to adopt national measures.

Moreover, the ECJ ruled that since Article 11(1) of the CFP marks an exception from the general rule of Article 6 of the CFP, according to which the Union shall be responsible for adopting conservation measures, its provisions must be interpreted narrowly.[35] The scope of unilateral action by Member States may only be extended so that they can take measures exclusively applicable within the initiating Member State's coastal waters (12 nautical mile zone).[36] Fishing vessels of other Member States also have fishing rights in the waters of 3–12 nautical miles of German coastal waters, for example the Netherlands, or Denmark with a view to the North Sea.

Danish saneel fishery in British waters

4.2 Exclusive EU competence pursuant to Article 11(2) CFP

In contrast to a scenario of only national significance as set forth under Article 11(1) of the CFP, in the case of regulatory demands regarding fishing activities in protected areas as laid down in Article 11(2) of the CFP, the Union's exclusive competence is not relinquished in favour of the regulatory power of individual Member States – on the sole ground that other Member States or their fishing participants could be affected by a given conservation measure. Under this latter scenario, the Union legislator obviously deemed it crucial to prevent the Member States concerned from acting independently, even in cases where no common solution can be found.[37] The fact that Member States' environmental obligations have been absorbed by the CFP, thus obscuring their accountability, has drawn criticism from various quarters.[38]

31 *See, for the first time, Judgment by the ECJ in Case 804/79 regarding Article 102 of the Act of Accession for Denmark, Ireland, and the United Kingdom.*
32 *Callies, C. in Calliess, C. & Ruffert, M. (2016), Article 2 of the TFEU, marginal note 10.*
33 *See Judgment by the ECJ in Case C 683/16 of 13 June 2018, marginal note 56.*
34 *See Greenpeace et al. (2017).*
35 *Case C 683/16, marginal note 60*
36 *Article 20 of the CFP.*
37 *Article 20 of the CFP.*
38 *See Salomon, M. et al. (2014), p. 80 with further references.*

A Member State initiating conservation measures for territorial protection must consult with all other Member States having a direct management interest in the affected fisheries and can only realize its project in the form of a joint recommendation to the Commission prepared by such group of Member States (Article 11(2) of the CFP). The term „direct management interest" is defined in Article 4(1)(22) of the CFP as meaning an interest „consisting of either fishing opportunities or a fishery taking place in the exclusive economic zone of the Member State concerned".

As regards the factor „fishing opportunities", a Member State's direct management interest can easily be identified by comparing the annually agreed total allowable catches (TACs). Under the concept of so-called „relative stability", TACs are divided among Member States as quotas with a view to ensuring that each Member State's share in a given stock remains constant from year to year.[39] The relative stability of fishing opportunities corresponds to the consistency of a Member State's management interest within the meaning of Article 11(2) of the CFP, which simplifies the applicability of this criterion. In order for the alternative factor „fishery taking place in the exclusive economic zone of the Member State concerned" to have its own justification alongside „fishing opportunities", it can only mean fishing for non-quota species. According to the EU Commission, applicability of Article 11(2) of the CFP can even be based on a purely historical management interest - i.e., only past fishing activities in the fisheries regulated by the measures.

This broad definition means that a large number of the Member States bordering a given sea basin may have a direct management interest with respect to fisheries measures to be implemented in another Member State's EEZ. An equally large number of Member States can block or, through lengthy negotiations, delay or weaken fisheries measures initiated by another Member State. Moreover, Article 11(2) reintroduces the unanimity requirement through the back door, since majority decisions otherwise regularly suffice for Member States to agree on conservations measures in the realms of both environmental policy and the Common Fisheries Policy.

4.3 Requirements for joint recommendations

To facilitate application of the new Article 11 of the CFP, the EU Commission has published a working document on the establishment of conservation measures under the Common Fisheries Policy.[40] The document describes, amongst other things, the requirements for joint recommendations to the Commission by the affected Member States, noting in particular that the description of the proposed measures should be „clear, complete and fit for purpose in line with Article 11(1) of the CFP".[41] Member States shall use their obligations under Union environmental legislation and the conservation objectives of the sites concerned as a starting point for their recommendations. In particular, they shall provide detail as to why the proposed measures are necessary and proportionate and take into consideration the precautionary approach to fisheries management pursuant to Article 4(8) of the CFP.

Further, following a *best practice* approach, the document lists the wideranging information ideally provided by the Member States with the submission of a joint recommendation.[42] It requires Member States to provide comprehensive documentation containing not only a biological and ecological assessment of the proposed measures but also a detailed description of fisheries activities in the area concerned and the expected impacts of the proposed measure on fishing, including socio-economic aspects. Moreover, the proposed monitoring, control and enforcement measures shall be clearly set out.

39 *See for example Regulations (EU) 2017/1970 of 27 October 2017 and (EU) 2018/120 of 23 January 2018 for the fishing opportuni-ties 2018 in the Baltic and North Sea.*

40 *EU-Commission (2018).*

41 *Ibid., p. 4.*

42 *Ibid., p. 5-6.*

PRELIMINARY ACTION	6 MONTH TIME FRAME	3 MONTH TIME FRAME
Informal consultations of the initiating Member State with stakeholders and other Member States having a direct management interest; preparation of the required description and documentation of the proposed measures	Negotiations on a joint recommendation among all participating Member States at the technical level of the competent fisheries ministries, followed by submission of the final joint recommendation to the EU Commission	Adoption of the delegated act by the Commission

4.4 Efficiency of the process pursuant to Article 11(3) of the CFP

Given the extensive documentation and presentation obligations of the initiating Member State, the time frame of six months set aside for the preparation of a joint recommendation – during which agreement among Member States must first be reached – is relatively short. The EU Commission therefore advises the initiating Member State to undertake informal consultations with other Member States and stakeholders concerned before the official six-month period is triggered.[43] This is countered by the argument that such informal preliminary talks may reduce the amount of publicly available information, thereby potentially undermining the transparency of the process and the accountability of decisionmakers. **Last but not least, extensive discussions in preparation of conservation measures risk delaying their adoption and, thus, the necessary protection of vulnerable species and habitat.**[44]

Previous applications of the process show that it may at times be difficult for Member States to reach the required agreement before expiry of the six-month time period. It is enough for a small number of Member States, or even just one, to not be in favour of the initiating Member State's plan to prevent agreement on environmentally sustainable conservation measures within the set time frame.

Blockade can take many forms: For example, the process frequently requires the furnishing of newly updated fisheries data which only the participating Member States having fisheries interests themselves can provide. This obligation to deliver may be compromised by uncooperative behaviour, with Member States requesting data updates only to prolong proceedings. Similarly, participants in previous discussions have found that **some Member States, rather than making technically sound joint recommendations their top priority, focus on achieving optimum results for their national fisheries sector. This pattern of behaviour resembles the one exhibited in the discussion of fishing opportunities as part of the annual fixing of quotas in the Council of Ministers, where some Member State's consent is also primarily dependent on their own economic interests.**

Another weakness of the process as laid down under Article 11(2) is the fact that in the course of consultations, affected Member States may demand far-reaching changes to the contents or scope of conservation measures or some of their components by calling into question the underlying scientific evidence or related assessment. Since the scientific reasoning behind a proposed conservation measure is mostly provided by national research institutions, it is not regarded as independent scientific expertise superseding national particular interests. Against this background, Member States with conflicting fisheries interests may attempt to mitigate or prevent a proposed conservation measure by presenting differing scientific assessments.

The wording of the Basic Regulation stipulates no intermediary or advisory role for the Commission in the negotiation of a joint recommendation. It shall merely facilitate cooperation among all Member States concerned in the process of implementation and enforcement of measures already adopted (Article 11(6) of the CFP). However, even in the absence of specific authorization, the Commission could take on the role of intermediary on the strength of its capacity as the guardian of EU law (Article 17 of the TEU). Thus, the current Action Plan for nature, people and the economy[45] encourages the Commission to work more closely with the Member States to promote swift implementation of the Natura 2000 measures as a reaction to the shortcomings in establishing the Natura 2000 sites in the marine environment. Completion of the Natura 2000 network, in particular in the marine environment, and implementation of the necessary conservation measures are actions prioritized under the Plan.[46] **One possibility for the initiating**

43 *Ibid., S. 3.*
44 *See the criticism by Client Earth (2016), p. 10.*
45 *EU-Commission (2017).*
46 *Ibid., p. 6*

Member State would therefore be to seek greater involvement of the Commission as intermediary.

In case the participating Member States fail agree on a joint recommendation, the Basic Regulation provides that ultimately the Commission itself may submit a legally compliant proposal. The same shall apply if a recommendation submitted by the Member States fails to comply with the legal requirements. In such case, the Commission is free to amend the recommendation in breach of the nature conservation requirements of EU law within the framework of its delegated act pursuant to Article 18(1) of the Basic Regulation. To date, the Commission has never made use of this right of reversion.

As a last resort, the management measures as set forth under Article 11(2) are subject to the control of the European Parliament and the Council of Ministers, which are entitled to object to delegated acts of the Commission under Article 46(5) of the Basic Regulation. For the first time in June 2018, the European Parliament rejected fisheries measures initiated by a Member State in this way, thus preventing their entry into force.[47] In its motion for a resolution, the Parliament raised concerns about the appropriateness of the measures proposed for the Belgian part of the North Sea and their effectiveness for protected species (in particular scoters, harbour porpoises and seals) and habitats (sandbanks and reefs), as well as for the protection of sea floor integrity against seabed-impacting fishing gear. The proposed measures, which Germany as a member of the Scheveningen Group had helped negotiate, provided for hardly any restrictions on fishing.

Harbour seal (Phoca vitulina)

Expert assessment:

Pursuant to the systematic interpretation of the provisions of the CFP Basic Regulation by the ECJ in the „Deutscher Naturschutzring“[48] case , the fact that an exception is set forth under Article 11(1) of the CFP means that slow fulfilment of nature conservation obligations applicable in a given EEZ through appropriate management measures cannot be deemed a national failure and blamed on the responsible coastal state as long as fisheries participants flying the flag of other Member States are affected. In such case, due to the provisions of EU fisheries law, the EU coastal state responsible under environmental law is not competent, and cannot be held accountable, if the conservation measures required under environmental law are either (through its own fault) not ambitious enough or abandoned, or (through the fault of others) weakened or delayed by other Member States involved in the process. Unilateral action by a Member State is excluded even if the process as per Article 11(2) and (3) of the CFP proves unsuccessful in delivering appropriate results in terms of time and contents. **Thus, after five years of application, the main criticism of Article 11 of the CFP is still that Member States are obliged to establish effective marine protected areas but are restricted in their competence to regulate fishery activities in these areas.**[49]

The statutory requirement of a unanimous recommendation by all Member States with management interests means that fisheries interests are frequently given preference over environmental protection concerns. As a result of inadequate procedural standards, conservation measures may be weakened until any conflict with fisheries interests is resolved. Thus, the generally unbalanced design of Article 11 of the CFP means that its provisions actually prevent optimal nature conservation from being even remotely achieved.

47 *See EU Parliament (2018).*

48 *Judgment by the ECJ in Case C 683/16 of 13 June 2018*

49 *See the initial criticism by Salomon, M. et al. (2014), p. 81.*

5. Effectiveness of the landing obligation (Article 15 of the CFP)

The landing obligation is one of the new rules of the CFP that was expected to greatly benefit stock conservation and marine protection. It was designed to end the practice of discards of unwanted (by)catches long deemed unacceptable by nature conservation experts and society as a whole. The preamble to the CFP Basic Regulation notes:

„Measures are needed to reduce the current high levels of unwanted catches and to gradually eliminate discards. Unwanted catches and discards constitute a substantial waste and negatively affect the sustainable exploitation of marine biological resources and marine ecosystems and the financial viability of fisheries."

Apart from the call to prevent the illegitimate killing of animals, the wasting of food resources, and the disrespectful handling of marine life in general, the regulation was initially also motivated by stock management considerations: Comprehensive recording of all landings was intended to improve data availability for stock assessment.[50] Besides enhancing catch documentation, a reduction in fishing mortality as aimed at by the landing obligation is also seen as directly contributing to the rebuilding of stocks and to meeting the objective of managing all stocks in line with the maximum sustainable yield (Article 2(2) of the CFP).[51]

5.1 Limited scope of the landing obligation

Pursuant to Article 2(5)(a) of the CFP, one of its objectives is to „gradually eliminate discards (…) by avoiding and reducing, as far as possible, unwanted catches, and by gradually ensuring that catches are landed". The main means to this end is the landing obligation as stipulated in Article 15 of the CFP, which details the species covered by and time frames for the entry into force of the landing obligation.

Following introduction of the regulation on a progressive, incremental basis, from 1 January 2019, all catches of species which are subject to catch limits in the fisheries and areas listed in the Basic Regulation „shall be brought and retained on board the fishing vessels, recorded, landed and counted against the quotas" (Article 15(1) of the CFP).

Species which are subject to catch limits may therefore no longer be discarded, while incidental catches of non-quota fish species, or non-fish species such as molluscs or seabirds, are exempted from the landing obligation. They do not have to be landed or registered, which is widely criticised by conservationists.[52] Moreover, the following three types of exemptions expressly do not fall within the scope of the landing obligation (Article 15(4) of the CFP):

- Species in respect of which fishing is prohibited and which are identified as such in a Union legal act adopted in the area of the CFP;
- Species for which scientific evidence demonstrates high survival rates, taking into account the characteristics of the gear, of the fishing practices, and of the ecosystem;
- Catches falling under de minimis exemptions.

Species for which fishing is prohibited are listed in the applicable quota regulations[53], which include a large number of shark and ray species, such as spurdog (Squalus acanthias). In 2017, the European Commission proposed a closure of all fisheries for European eel (Anguilla anguilla), which the EU Council of Ministers failed to adopt. Any specimens of a listed species accidentally caught must be promptly released.[54]

Mud shark (Squalus acanthias)

Whether and to what extent scientific evidence of high survival rates or de minimis exemptions for a given fishery are recognised is only regulated by the respective regional implementation rules for the landing obligation. Ab initio it proved to be one of the flaws of the Basic Regulation that its definition of exemptions to the landing obligation is rather general. In particular, no concrete stipulations, such as percentages, are made for „high survival rates" of bycatches. For the criterion of „negligibility", a limit of five % of total annual catches is set. Implementing acts regarding the landing obligation may only provide for such derogations for individual fisheries or species, also termed „de minimis" exemptions, if scientific evidence indicates that increases in selectivity

50 *See for example Kraus, G. & Döring, R. (2013), p. 6.*
51 *For more details, see Pew Charitable Trusts, Seas at Risk et al. (2018).*
52 *The German Council on the Environment (2011).*
53 *For 2018: Article 13 of Regulation (EU) 2018/120 of 23 January 2018.*
54 *Ibid., Article 13(2).*

are very difficult to achieve or the refitting of fishing vessels would be disproportionately costly compared to the expected bycatch (Article 15(5)(c) of the CFP).

5.2 Implementation on a regional level

The landing obligation is implemented and the relevant details are agreed for each sea basin at regional level, either through multi-annual plans adopted at EU level or through designated discard plans. In the absence of regional agreements, the Commission may also adopt de minimis exemptions by means of delegated acts. There are many differences between implementation of the landing obligation in the Baltic Sea and in the North Sea:

● BALTIC SEA

Compared to other sea basins, the state of fisheries – and hence implementation of the landing obligation – in the Baltic Sea is uncomplicated, given the fact that there are only five quota species (cod, herring, salmon, plaice, sprat). In each of these fisheries, any unwanted bycatch of the other four species must be landed. Details on the landing obligation are laid down in the Multi-Annual Plan for the Baltic Sea[55], supplemented by two Commission delegated acts[56]. A survivability exemption applies to the fisheries for herring, sprat and cod as long as these fish are caught with trap-nets, creels/pots, fyke-nets and pound nets. In such case, salmon, plaice and undersize cod of up to 35 cm in length may be released back into the sea. Fish damaged in the course of feeding activities of other animals are also exempt from the landing obligation. There are no de minimis exemptions in place for the Baltic Sea.

Following delayed introduction of the landing obligation from 2015 onwards, the Baltic cod fishery served as a first test. Initial scientific evaluations show that the legislation does not take effect as regards this fishery: Discards have not been eliminated and data availability for stocks has not improved.[57] Based on the findings to date, it seems clear that the expectation that the current regulation could incentivise changes in fishing practices towards higher selectivity has not been met and will in fact most likely „remain a pious hope".[58]

Fish trap

● NORTH SEA

Due to different ecosystem conditions, implementation of the landing obligation in the North Sea is far more complex – not just because of the abundance of target species and the mixture of species in mixed fisheries, but also because of the significantly larger number of fleet segments (76) using a variety of fishing gears prone to different levels of bycatch.[59] Moreover, bycatch rates vary greatly across North Sea fisheries.[60]

Based on the multi-annual plan for demersal fisheries in the North Sea[61], details on the landing obligation pursuant to Article 15 of the CFP Basic Regulation as applicable to these stocks were last provided by a Commission delegated regulation for the time period 2019–2021.[62] The pertaining joint recommendations were prepared by the seven Member States having a direct management interest, i.e., Belgium, Denmark, France, the Netherlands, Sweden, the UK, and Germany, and evaluated by the Commission's Scientific, Technical and Economic Committee for Fisheries (STECF).[63]

55 *Article 7 of Regulation (EU) 2016/1139 of the European Parliament and of the Council of 6 July 2016 establishing a multiannual plan for the stocks of cod, herring and sprat in the Baltic Sea and the fisheries exploiting those stocks.*

56 *Regional implementation currently under the Commission Delegated Regulation (EU) 2018/306 of 18 December 2017 laying down specifications for the implementation of the landing obligation as regards cod and plaice in Baltic Sea fisheries and the Commission Delegated Regulation (EU) 2018/211 of 21 November 2017 establishing a discard plan as regards salmon in the Baltic Sea.*

57 *See for example Borges, L. (2016).*

58 *Valentisson, L. et al. (2019).*

59 *See Ulrich, C. (2016), p. 25 et seq.*

60 *ICES (2017).*

61 *See Regulation (EU) 2018/973, Multi-annual plan North Sea, Article 11.*

62 *Commission Delegated Regulation (EU) 2018/2035 of 18 October 2018 specifying details of implementation of the landing obliga-tion for certain demersal fisheries in the North Sea for the period 2019-2021.*

63 *Scientific, Technical and Economic Committee for Fisheries (2018).*

Unlike in the case of the Baltic Sea, the scope of the landing obligation in the North Sea is limited by a long list of derogations granted on the virtue of high survival rates or low bycatch. The resulting intricate pattern of rules and exemptions is made even more complex by the fact that few derogations actually apply to the whole of the North Sea: Rather, most only cover one or two of the three ICES areas (2a, 3a, and 4) into which the North Sea is divided for fisheries management purposes.[64] STECF has highlighted the large number of – mainly de minimis – exemptions and critically noted that taken as a whole, they could potentially lead to such large quantities of discards that the objectives of the landing obligation may be jeopardised.[65]

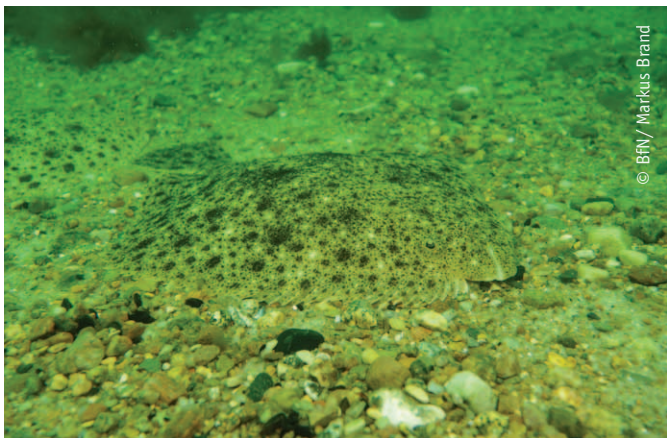
Many of the exemptions granted for the North Sea are based on an assumption of high survivability of the species concerned. Survivability needs to be scientifically proven, and justified in terms of fishing gear, fishing method and the ecosystem. Where exemptions are granted, specimens highly likely to survive their release back into the sea undamaged should be able to enhance their stock's future growth. The Basic Regulation has been under criticism for failing to provide an exact definition of „high survival rates"[66]. From a scientific point of view, assumptions of percentages of survivability are generally difficult to evaluate as studies conducted under different conditions produce diverging results and can therefore only serve to give rough estimates.[67]

One of the species for which the Commission has granted a survivability exemption is plaice. Amongst other things, the Commission delegated regulation provides for a derogation for plaice below the minimum conservation reference size in beam trawling with small mesh sizes[68]– although an STECF report had advised against a derogation for this fishery, arguing that a survival rate of more than 20 % for juvenile plaice in beam trawling has not been proven so far.[69] It seems highly unlikely that the criterion of survivability[70] as set forth under the CFP Basic Regulation is indeed fulfilled if only such a small proportion of discards is assumed to be capable of survival. The Commission nevertheless granted the derogation, albeit limiting it to one year and requiring Member States having a direct management interest to provide further information to substantiate the assumption of high survivability. What is still missing is an explicit requirement for fishery participants to fully document all catches, bycatches and the duration of hauls and retention prior to discarding.

The case of the crab fishery illustrates the extent to which the adoption of derogations by the European Commission may in fact be a political decision designed to serve the economic interests of Member States.[71] Operated largely by the Netherlands and Germany, this fishery would also have been subject to the EU-wide discard ban from 2019 onwards. Although there is no Total Allowabe Catch (TAC) in place for North Sea shrimp itself, the landing obligation categorically also applies to incidental bycatches of other quota species. Research by the Thünen Institute has shown that bycatches in German crab fisheries regularly include plaice, herring, whiting, sole, and cod.[72]

Following intense lobbying, backed by the state government of Lower Saxony[73], amongst others, North Sea shrimp beam trawlers have not been granted a de minimis exemption[74] in accordance with the provisions of Article 15(5)(c) of the CFP Basic Regulation. Besides the five typical bycatch species listed above, the derogation includes sprat, sand eel, lemon sole, turbot, and brill,[75] and is currently limited to a proportion of seven % (2019 and 2020) and six % (2021) of total annual catches, cumulatively applicable to all ten species. The de minimis limit of five % as set forth under the CFP Basic Regulation must be reached not later than by 2023. The granted percentage does not apply per bycatch species but to the total of all ten species declared as bycatch by the Member States, irrespective of where fishing takes place and whether there really are bycatches of all of the above species in a given fishery. This cumulative – rather than species-specific – definition of the exemption carries the risk that for some species, the percentage of discards may be well above the de minimis level of 5–7 %. The derogation permits total discards in an amount of around 3,700 tonnes.[76]

64 *See the overview in: Federal Institute for Agriculture and Food (BLE) (2019).*
65 *See Scientific, Technical and Economic Committee for Fisheries (2018), p. 12.*
66 *Zimmermann, C. et al. (2015).*
67 *See Scientific, Technical and Economic Committee for Fisheries (2018), p. 58.*
68 *Article 7 of Commission Delegated Regulation 2018/2035, Fn. 66.*
69 *Scientific, Technical and Economic Committee for Fisheries (2018), p. 115.*
70 *Article 7(2) of Commission Delegated Regulation 2018/2035, Fn. 66.*
71 *Cf. Ulrich, C. (2018).*
72 *Schulte, K. et al. (2015), p. 14.*
73 *See Lower Saxony Ministry of Federal and European Affairs and Regional Development (2018)*
74 *Article 9 i) of Commission Delegated Regulation 2018/2035, Fn. 66.*
75 *Scientific, Technical and Economic Committee for Fisheries (2018), p. 100.*
76 *Ibid.*



Turbot (Scophthalmus maximus), Adler Ground, Baltic Sea

Shrimper

The rationale of the underlying joint recommendation by the Member States concerned is that any further increases in selectivity beyond the measures already implemented will be difficult to achieve. Moreover, further handing of unwanted catches onboard fishing vessels is deemed disproportionately uneconomical given the difficulty of distinguishing whether or not very small undersized individuals belong to the target species during catch sorting, for which an additional crew member would be required.[77]

Under the current rules, fishermen in possession of a fishing authorization/quota are free to release set amounts of a lot of quota species back into the sea, while being required to land all other fish. There are no rules in place for bycatches beyond the scope of the exemption. Neither the Commission implementing regulation for North Sea demersal fisheries, nor the German implementing provisions by the German Federal Institute for Agriculture and Food (BLE) in force since early 2019[78] or the additional information sheet published by the latter contain any further specifications – despite a warning by STECF that under the CFP Basic Regulation, the granting of de minimis exemptions demands full recording of all catches plus accurate and detailed documentation of all fishing trips (Article 15(5)(c),(13)). **Strict monitoring is especially important in the case of cumulative de minimis exemptions for several species, as for example in crab fisheries.**[79]

5.3 The problem of choke species: How much flexibility is pertinent?

The so-called „mixed" fisheries in the North Sea are characterised by a large number of target and bycatch species. Given the biodiversity and great amount of stocks, the tableau of fishing opportunities and catch compositions is complex. One of the issues regarding implementation of the landing obligation raised in particular by the fishing industry is the problem of so-called „choke" situations, in which fishing of one or several species in a (mixed) fishery is prohibited because the quota for another species is lacking or exhausted – hence the term „choke species" or „choke quota".[80]

Distribution of the annually agreed total allowable catches among Member States in the form of national quotas is based on the concept of „relative stability". Member States are allocated a fixed percentage of the relevant total allowable catches originally granted to them – mainly based on historic catch levels – upon entry into force of the CFP or a state's accession to the EU. In many cases, this process is aimed at safeguarding local communities that are especially dependent on fisheries and related activities, by taking full account of their specific needs.[81] Thus, while Member States are not allocated the same quota every year, they do receive the same percentage of the annually agreed total allowable catch per stock.

77 *Ibid., p. 102.*
78 *Federal Institute for Agriculture and Food (BLE) (2018).*
79 *Scientific, Technical and Economic Committee for Fisheries (2018), p. 59.*
80 *Cf. for example Zimmermann, C. (2015).*
81 *Preamble of the Basic Regulation, Section 36, with reference to a Council Resolution of 3 November 1976.*

In some cases, a Member State may not have a quota for a certain stock although the latter is located in an area where the Member State has fishing opportunities for other stocks. In the majority of mixed fisheries, fully selective harvesting of target species is impossible. Unwanted bycatch always (and only) seems unavoidable when target species are associated with other fish species and fishnets do not allow for a separation of species already during fishing. Ever since, and even prior to, entry into force of the CFP, choke situations have been regarded as an impediment to the implementation of the landing obligation. Against this background, the Advisory Councils consisting of stakeholders advising on conservation matters on a regional level have examined the problem per region on a stock-by-stock basis and performed a nuanced classification of potential choke situation based on four different categories:

Choke Category	Meaning
1	Sufficient national quota
2	Insufficient national quota
3	Insufficient EU total allowable catches
4	Large quantities of bycatch landed threaten viability of fishing operation

Tab. 5: Different categories of choke species

The situation of German North Sea fisheries was as follows:[82]

Fish stock/area	Choke Category
Skagerrak cod	2
Kattegat codt	2 or 3
Kattegat plaice	2
Whiting	2

Tab. 6: Choke categories of different fish stocks in the North Sea

Besides the above-detailed (de minimis and survivability) exemptions as set forth under Article 15 of the CFP Basic Regulation – extensive application of which risks undermining the objective of achieving sustainable stock sizes –, there are a number of measures and flexibility mechanisms that can facilitate the implementation of the landing obligation and elimination of discards, as well as prevent choke situations. This includes:

- **For Category 1 chokes:** Reallocating national quota and, where necessary, creating individual fishing opportunities for bycatch species (within the scope of Article 16 of the CFP);
- **For Category 2 chokes:** Promoting quota swapping between Member States;
- **For Category 3 chokes:** Exhausting all means to reduce bycatches through selective fishing gears as well as strategic and tactical measures for the adjustment of fishing efforts (such as real-time closures) prior to contemplating exemptions from the landing obligation. The European Marine and Fisheries Fund provides funds for further research into and testing of fishing gear.

82 *North Sea Advisory Council (2018).*

Where a Category 3 choke situation remains unchanged despite application of the above measures and, if indicated, the granting of justified exemptions, Member States may resort to additional year-to-year and cross-species flexibility measures (Article 15(8) and (9)). However, STECF has warned that application of these flexibility rules may result in catches in excess of sustainable amounts, with a risk of the condition of affected stocks deteriorating.[83]

Once all of the above measures and appropriate flexibility mechanisms have been applied without the choke situation being remedied, the fishery must be closed.[84] There have been cases where low-value bycatch species were no longer subjected to TACs if they got in the way of fishing of target species – as in the case of the combined TAC for North Sea dab and flounder (2017). However, in order for the landing obligation to have the desired incentive effect, existing catch limits should remain in place.[85]

5.4 Does the landing obligation promote more selective fishing? How to enhance effectiveness of Article 15 of the CFP

The landing obligation represents a results-oriented approach that has raised high expectations for bycatch reduction. During the implementation phase, this realignment of the CPF poses major challenges for fisheries managers and fishermen. A report to the Committee on Fisheries of the European Parliament notes: „The landing obligation represents probably the most important paradigm shift in the history of the Common Fishery Policy. When discarding is allowed, fishing is driven by maximising the value of the fraction of the catch that can be landed. When discarding is banned, fishing becomes also driven by minimising the quantity of the fraction of the catch that cannot be landed. This means that fishers become accountable for their entire catches of regulated stocks, and not of their landings only."[86] Through such accountability, the landing obligation has created an incentive to avoid unwanted catches, in particular through improved selectivity, which should hence be the primary focus of implementation.[87]

The point is frequently made that strategic and/or tactical changes in fishing behaviour of fishermen – e.g., choosing different areas or times for fishing operations – are crucial for reducing unwanted catch.[88] In many cases, closer cooperation among fishing operators, and science–industry collaborations, could drive more selective strategies, e.g., by exchanging real-time information on bycatch rates.[89] However, this course of action reaches its limits where spatial distribution of a given bycatch species or of juveniles is so wide that there are hardly any areas where they do not occur.

Another important step is the use of gear that is as selective as possible. New gear needs to be researched and made available, and requires a willingness on the part of fishing operators to make the shift to up-to-date technology. In order to broaden the range of gears that meet the specific requirements of the landing obligation, different disciplines must work together, including fishers, net and gear manufacturers, fisheries engineers, and fish behaviour experts.[90] Throughout, the focus must remain on those to whom the desired changes are addressed, i.e., the fishing operators. Hence, it should, amongst other things, be ensured that key findings from research into and the testing of new fishing techniques are distributed in lay language (and in the relevant national language), participation in trial projects is sufficiently incentivised, and easy options for economic cost/benefit analysis are provided, including information on subsidies available for changes in fishing gear or its use.[91]

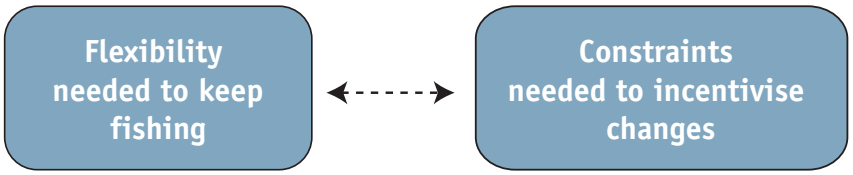


Fig. 3: The landing obligation dilemma. Source: C. Ulrich (2018).

83 *Scientific, Technical and Economic Committee for Fisheries (2018).*
84 *See Pew Charitable Trusts, Seas at Risk et al. (2018).*
85 *Borges et al. (2018).*
86 *Ulrich, C. (2018).*
87 *Scientific, Technical and Economic Committee for Fisheries (2018), p. 58.*
88 *See for example Zimmermann (2015).*
89 *O'Neill, F.G. (2019).*
90 *Ibid.*
91 *Ibid.*

Finally, it is widely agreed that the landing obligation will prove futile without proper implementation by the control authorities.[92] Therefore, proof of compliance with the landing obligation must be mandatory in order to achieve a reduction, if not elimination, of bycatches.

5.5 Control of the landing obligation

The success of the landing obligation in incentivizing improvements in selectivity largely depends on the extent to which compliance is monitored. Under Article 15(13) of the CFP, Member States shall ensure „detailed and accurate documentation of all fishing trips". To this end, adequate capacity must be provided, such as observers and Remote Electronic Monitoring, including closed-circuit television (CCTV).

Detailed conditions for effective control of the landing obligation by the Member States are set forth in the EU Control Regulation[93] and accompanying Implementing Regulation[94]. However, the applicable fisheries control regime was drawn up prior to entry into force of the reformed CFP and is therefore not entirely consistent with it. This means that breaches of the CFP cannot always be effectively combated, which is why the regulatory framework of the Control Regulation is currently under revision (See chapter 3.).

● ORGANISING OF CONTROL IN GERMANY

In Germany, both the Federal Government and the states are responsible for monitoring compliance with the landing obligation. Details of the division of tasks are laid down in the German Marine Fisheries Act (SeeFischG). Under § 2(1) of the SeeFischG, the Federal Government shall be responsible for all tasks to be carried out pursuant to the Annex to § 2 of the SeeFischG. Similarly, all duties of the fisheries monitoring centre established under EU law shall be exclusively performed by the Federal Government (§ 6 of the SeeFischG), including in particular satellite surveillance of fishing vessels at sea, whilst fisheries control in ports shall rest in the hands of the states.

Unit 523 (Fisheries Control, Fishing Industry) of the German Federal Institute for Agriculture and Food (BLE) is currently in charge of implementing both Community and German fisheries law, fisheries control at sea, and monitoring of all landings of fishing vessels larger than 500 GT (Gross Tonnage).

In the Baltic Sea region, fisheries control at sea in Mecklenburg-Vorpommern to be performed within the 3 nautical mile zone is organised by the State Office for Agriculture, Food Safety and Fisheries, and beyond this zone by the BLE. By contrast, in Schleswig-Holstein, fisheries control within the entire territorial sea is organised by the competent state authorities (see below) and only outside the 12 nautical mile zone by the BLE.

In the North Sea, fisheries control at sea in the German Exclusive Economic Zone (EEZ) is organised by the BLE. Surveillance in coastal waters (within the 12 nautical mile zone) is the responsibility of the competent state fisheries authorities: In Schleswig-Holstein, the Schleswig-Holstein Water Police and the State Office for Agriculture, Environment and Rural Areas (LLUR). Water Police inspectors are exclusively tasked with at-sea monitoring, while LLUR inspectors only inspect landings. In Lower Saxony and Bremen, the Bremerhaven State Fisheries Office is in charge of monitoring (at sea and on land). Inspectors in Lower Saxony and Bremen are tasked with both at-sea monitoring and landing inspections.

Fishing vessels must land all fish species (above certain thresholds expressed in live weight) which are subject to multi-annual plans in a designated port or offshore location. Undersized fish not fit for human consumption – so-called K3 goods ¬– are disposed in storage facilities provided by the fisheries cooperatives and thereafter passed on to the processing industry. K3 goods must be stored separately both during transport and in cold stores and are subject to the applicable health rules as regards animal by-products not intended for human consumption

● LACK OF CONTROL OF THE LANDING OBLIGATION

The EU Scientific, Technical and Economic Committee for Fisheries (STECF) finds that there are substantial deficits in implementing the landing obligation across EU Member States. In some, at-sea monitoring efforts for the year 2017 were less than in 2016[95], mainly due to a refusal to allow at-sea observers on board fishing vessels. **Fisheries managers, observers, and scientists are all convinced that there is widespread non-compliance with the landing obligation and a high level of illegal and unreported discards.**[96]

92 *See for example Kraus & Döring (2013), p. 6.*
93 *Council Regulation (EC) No 1224/2009.*
94 *Commission Implementing Regulation (EU) No 404/2011.*
95 *https://stecf.jrc.ec.europa.eu/c/document_library/get_file?uuid=91be62f0-3aa7-4151-8a0c-b595444a8458&groupId=43805*
96 *Borges, L., Penas Lado, E. (2019).*

According to a query to the German Federal Government[97], for 2016, at-sea monitoring by the German fisheries surveillance authorities covered a mere 1.5 % of German fishing trips in the Baltic and 0.7 % of German fishing trips in the North Sea. What's more, control efforts in the Baltic mainly focused on passive fisheries – despite the fact that the use of active fishing methods such as towed gear poses a much higher risk of generating large amounts of bycatch and not complying with the landing obligation.

The landing obligation for Baltic cod has been in place since 2015, providing that cod below the minimum conservation reference size of 35 cm must be landed and counted against the quotas but not be used for human consumption. However, based on observer data, the estimated discard amount for Eastern Baltic cod was 11% of total catches (in terms of weight) in 2017[98]. Since some Member States are facing increasing difficulties in placing at-sea observers onboard fishing vessels, a discard rate of 11% is widely assumed to be an underestimate. Moreover, the results of self-reporting – the documenting of undersized bycatch in logbooks by fishers – deviate significantly from scientific estimates of undersized catches: For the year 2015, the latter amounted to 16 times the amounts recorded by fishermen as logbook data for Western Baltic cod, and 10 times the self-reported amounts for Eastern Baltic cod.[99]

To date, it is common practice for discards to not be fully documented and for controls to be too sporadic and lacking in scope to ensure effective implementation of the landing obligation – which means that a key factor for its success continues to be missing. **Besides, since parts of the fisheries sector strongly oppose the introduction of comprehensive Remote Electronic Monitoring, in particular by means of video cameras onboard fishing vessels, a reversal of the burden of proof to the detriment of fishermen may be advisable, so as to make proof of compliance with the landing obligation a condition of fishing.**[100]

5.6 Exploitation of bycatch landed

Once the landing obligation is fully implemented and, thus, fully effective, with bycatches reduced to a minimum, the question arises how to best capitalise the remaining bycatch landed. As a matter of principle, even then only large enough fish – i.e., fish above the minimum conservation reference size – may be marketed for direct human consumption.[101] The purpose of this provision is to prevent a demand for „baby fish".[102]

As a rule, bycatch should be marketed with the aim of achieving a high-value use. All fish fit for human consumption should be used as such.[103] All landings of fish below the minimum conservation reference size can be used as an important raw material or food additive (fatty acids, vitamins, minerals, etc.) in the food industry, or as an organic product in the manufacture of, e.g., natural cosmetics or pharmaceuticals. Bycatch not fit for human consumption can be marketed as animal feed in the form of fodder, fish meal, or fish oil.

In the absence of, and in addition to, options for a high-value use, different types of industrial uses (fish leather, chitin) may come into consideration, while the use of bycatch for energy production or as fertilizer should only be considered as a last resort. Determination of the best possible valorisation strategies requires thorough analysis of individual bycatch species – which must in turn be based on thorough documentation.[104]

Expert assessment:

Although the design of the landing obligation is rather complicated, its objective is clear: To reduce unwanted catches through changes in fishing practices and a shift towards more selective gears. At the same time, the landing obligation is one of several tools for achieving the overarching goal of sustainable EU stocks and fisheries.[105]

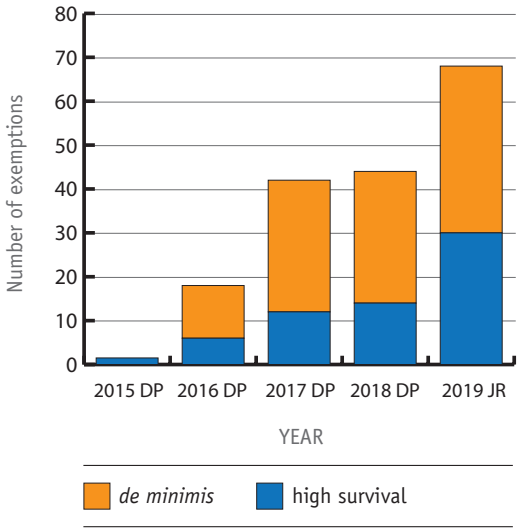


Fig. 4: Total number of exemptions granted because of de minimis and high survival from 2015–2019. Exemptions resulted from discard plans (DP) or from joint recommendations (JR). Source: STECF (2018).

97 Deutscher Bundestag. (German Parliament) (2017).
98 ICES Advice 2018.
99 Deutscher Bundestag (Gerrman Parliament) (2017).
100 Kraus, G. & Döring, R. (2013).
101 Article 15(12) of the CFP Basic Regulation.
102 Borges, L. & Penas Lado, E. (2019).
103 See: Iñarra, B. et al. (2019).
104 Ibid.
105 Borges et al. (2016).

Yet successful implementation of the landing obligation is hampered by the fact that more and more extensive exemptions are granted, which has been widely criticised (See Fig. 4).

Every exemption granted invariably removes the incentive to improve selectivity. Their large number makes effective monitoring almost impossible, as even at-sea observers will have difficulties registering whether or not catches released back into the sea are covered by a derogation. More restrictive rules are therefore called for. Under the CFP Basic Regulation, the decision to grant exemptions lies solely with the European Commission, while STECF as the scientifically competent panel of experts merely reviews the rigor and reliability of scientific evidence provided by the Member States. The case of the crab fishery illustrates the extent to which the granting of derogations may in fact be governed by political motives rather than scientific evaluation as required under the CFP Basic Regulation.

The granting of derogations must be reasonably contained. This also means that survivability exemptions must be ruled out for stocks without a scientifically proven survival rate of at least 50%.[106] STECF has noted that the MSY objective of the CFP can only be achieved if fishing limits are based on total allowable catches from which all relevant de minimis discards are deducted. Combined (multi-species) de minimis exemptions, based on a percentage of the sum of catches of several species, pose a particularly high risk of exceeding sustainable catches.[107]

The landing obligation is a new provision that requires a fundamental rethink on the part of both fisheries managers and operators. Optimising the landing obligation will take time, and will require a special focus on swift implementation of more effective control.

Catch of Cod (Gadus morhua), Baltic Sea

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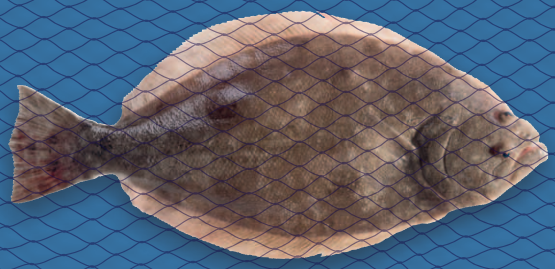
CHAPTER 3 | CONTROLS AND SANCTIONS



Dr. Markus Salomon

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CHAPTER 3 | CONTROLS AND SANCTIONS

1. Have fisheries controls been improved?

Successful implementation of the CFP relies heavily on its effective enforcement, comprising control, data transparency, and the sanctioning of violations. For this reason, the question of how the control of fishing activities in the EU has developed is of particular importance. As a rule, the Member States are obliged to ensure effective control of all fishing activities within their territory and of all fishing vessels flying their flag while operating outside of European waters, as well as compliance with the rules of the CFP (Article 36 of Regulation (EU) No. 1380/2013).

In the past, there have been considerable shortcomings in this respect. The latest reform of the Control Regulation was preceded by two reports, one by the European Court of Auditors[1] and one by the European Commission[2], prepared in 2007 and 2008, respectively, which both strongly criticized the CFP control system. This criticism was to be countered by means of the 2009 reform resulting in particular in an amended Fisheries Control Regulation (Regulation No. 1224/2009).[3]

1.1 Fisheries Control Regulation

The Fisheries Control Regulation obliges Member States to ensure control of all persons who carry out activities within the scope of the CFP in a Member State's territorial waters or in waters under its sovereignty or jurisdiction (Article 5 of Regulation No. 1224/2009). Member States shall also control all fishing vessels flying under their flag and fishing outside of European waters. Further, they shall allocate adequate financial, technical and human resources to enable such controls. Only European fishing vessels that hold a valid fishing licence may carry out fishing activities for commercial purposes (Article 6 of Regulation No. 1224/2009). Flag Member States shall be responsible for the allocation, management, and withdrawal of fishing licences. Moreover, in order to be permitted to carry out specific fishing activities, fishing vessels require a corresponding fishing authorisation (Article 7 of Regulation No. 1224/2009).

Fishing vessels shall be controlled by fitting them with control systems. Thus, fishing vessels of 12 metres or more in length have been obliged to carry on board satellite-based vessel monitoring systems (VMS) (see Article 9 of Regulation No. 1224/2009 and Articles 18 et seq. of Commission Implementing Regulation (EU) No. 404/2011). Transmission of VMS data to the competent fisheries monitoring bodies of the Member States at regular intervals allows for the recording of vessel positions.[4] Fishing vessels of between 12 and 15 metres in length may be exempted from this requirement provided they do not remain at sea for more than 24 hours or only fish within territorial waters. Further, all fishing vessels of 15 metres or more in length must be fitted with an automatic identification system (AIS) (Article 10 of Regulation No. 1224/2009).

To document fisheries activities, all vessels of more than 10 metres in length are obliged to carry on board a logbook in which specific information regarding their fishing activities must be recorded. Moreover, they must complete a landing declaration (Article 23 of Regulation No. 1224/2009). All such data shall be transmitted to the competent bodies. Vessels of 12 metres or more in length must do so in electronic form upon completion of the last haul (hauling of the net). Again, vessels of between 12 and 15 metres in length may be exempted from this requirement. However, Member States are obliged to record all fishing activities and landing of vessels smaller than 10 metres that are not subject to reporting duties and transmit such data to the EU Commission on an annual basis (Article 16 of Regulation No. 1224/2009).

Gillnet boat without logbook obligation

Moreover, transhipping operations from one vessel to another shall be regulated, fleet capacity must be managed, and fishing vessels may under the relevant multi-annual plans be required to land their catches in designated ports (see Articles 20–22, 38–41, and 43 of Regulation No. 1224/2009).

The Member States are obliged to monitor compliance with the CFP rules regarding fishing effort, fishing capacities, technical measures, as well as fishing restricted areas and the marketing of fisheries products (see, amongst others, Articles 26, 38, 47, 50, and 56 of Regulation No. 1224/2009). In addition, Member States shall monitor all catches by recreational fisheries practised from vessels and concerning stocks that are subject to recovery plans (Article 55 of Regulation No. 1224/2009).

1 *Court of Auditors (2007).*
2 *Commission of the European Communities (2008).*
3 *COUNCIL REGULATION (EC) No 1224/2009.*
4 *Probst, N. (2014).*

If the competent authorities become aware of an infringement of fisheries rules in the course of an inspection, they shall immediately take appropriate measures against the respective master of the fishing vessel or any other person responsible for such breach (Article 85 of Regulation No. 1224/2009). The proceedings relating to the infringement may be transferred to the competent authorities of the Flag Member State (Article 86 of Regulation No. 1224/2009). Further, the Member States shall ensure that appropriate measures are taken against any persons breaching the rules of the CFP (Article 89 of Regulation No. 1224/2009). Member States shall determine the level of sanctions at their own discretion. Sanctions must be proportionate to the respective breach and serve as a deterrent. Hence, serious infringements shall be punished by effective, proportionate and dissuasive administrative sanctions (Article 90(2) of Regulation No. 1224/2009). Additionally, any holder of a fishing licence who infringes the rules of the CFP shall be assigned a certain number of points under a point system to be drawn up by the Member State (Article 92 of Regulation No. 1224/2009). Once a specified number of points is exceeded, the fishing licence shall be suspended for at least two months. The period of suspension shall be increased with each further infringement, until permanent withdrawal of the licence. The Member States shall also enter all infringements in a national register of infringements (Article 93 of Regulation No. 1224/2009).

Application of the rules of the CFP by the Member States is controlled by the EU Commission (Article 96 of Regulation No. 1224/2009). The Commission is entitled to take appropriate measures, e.g., suspend or cancel financial aids, where the rules fail to be implemented. In the case of a Member State exceeding its allocated quota, such Member State's future quotas shall be reduced on the basis of a standardized calculation formula (Article 105 of Regulation No. 1224/2009). The same shall apply if the allocated fishing effort is exceeded (Article 106 of Regulation No. 1224/2009). The EU Commission is further authorised to take emergency measures against Member States committing infringements of particular gravity (Article 108 of Regulation No. 1224/2009).

In 2017, implementation of the amended Fisheries Control Regulation was reviewed both as part of a Commission REFIT process[5] and by the European Court of Auditors[6]. The title of the special report prepared by the latter – „EU fisheries controls: more efforts needed" – already indicates the auditors' general assessment: The European Court of Auditors concludes that although progress has been made since 2007 and the reform of the Control Regulation[7], there are still significant weaknesses. A visit to the Member States Spain, France, Italy, and the UK (mainly Scotland) revealed that the EU does not yet have a sufficiently effective system for fisheries controls in place to ensure the success of the CFP. The Member States have not yet fully implemented the rules of the EU Fisheries Control Regulation, and improvements are required in a number of areas. The auditors note shortcomings regarding, amongst others, the documenting of fleet capacities, the recording of fishing vessels through vessel monitoring systems (VMS), the transparency of quota allocation, the collection of data on fishing activities, and access to data for inspectors. In light of these deficiencies, the Court of Auditors has made a number of recommendations for improvement.[8]

1.2 Monitoring fishing capacities

The EU aims at balancing fishing fleet capacities with fishing opportunities.[9] To this end, fleet capacity ceilings in terms of engine power (kW) and gross tonnage (GT) are set for each Member State. New fishing vessels may only enter a fleet after the same capacity has left such fleet. The Member States are obliged to enter information on their fleets in a fleet register and to balance their fleet capacity with their fishing opportunities. In the case of overcapacities, they must draw up and implement action plans for fleet reduction. Further, the Member States shall report to the EU Commission on their efforts to adjust fleet capacity[10], and the Scientific, Technical and Economic Committee for Fisheries (STECF) shall consider such information when preparing its annual report.[11]

Moreover, the Member States must ensure the necessary control of their fleet capacities (Article 38 of Regulation No. 1224/2009). To do so, they require sufficient data on the characteristics of their fleets. **The European Court of Auditors has criticised the fact that inspections of fishing capacity by the Member States were partly incomplete[12] and that some Member States failed to draw up a monitoring plan to check the engine performance of their fishing vessels**, thus hindering verification of the accuracy of data entered in the national fleet registers, in which checks have found discrepancies of various kinds.[13] For example, in a number of cases, the information provided on the fishing capacity of vessels was inconsistent with their actual capacity.

The lack of data transparency can also hinder the proper allocation of fishing days. Effort limits are generally imposed by setting a maximum number of fishing days based on a vessel's fishing capacity so as to estimate its projected catches. Where the relevant information on capacity is incorrect, misallocations may occur.

In view of the weaknesses identified by the EU Court of Auditors, the latter recommends that Member States take measures to ensure the accuracy of any data entered in the national fleet registers, and that the Control Regulation be supplemented by more detailed rules on how to record the capacities of fishing vessels at regular intervals.

5 *European Commission (2017).*
6 *European Court of Auditors (2017).*
7 *See also European Commission (2014).*
8 *European Court of Auditors (2017).*
9 *Ibid.*
10 *European Commission (2019).*
11 *STECF (2018).*
12 *European Court of Auditors (2017).*
13 *Ibid.*

1.3 Transparent quota allocation

The Member States are responsible for allocating their quota and shall base such allocation on transparent and objective criteria. The environmental impacts of a fishery may also be taken into consideration. In practice, the Member States use different approaches. Some take on the allocation themselves, while others leave (parts of) it to producer organisations. The European Court of Auditors has found that in the latter case, Member States don't always know what criteria are applied[14] – France and Scotland, amongst others, have been criticized for a lack of transparency in this respect. It is feared that as a result, Member States may lack the information they need to assess the negative ecological and economic impacts of quota allocations and may therefore be unable to take adequate countermeasures. Also, there is a risk that some fisheries stakeholders may be given preferential treatment. In Germany, the Federal Institute for Agriculture and Food (BLE) is responsible for quota allocations, and is obliged to be transparent under the German Marine Fisheries Act.[15]

The Member States must ensure that quotas are adhered to. If quotas are exhausted, the EU Commission must be informed and the relevant fishery closed. To this end, the Commission provides an information exchange system. At the end of each year, the Commission cross-checks the allocated quotas against a Member State's reported catches, reducing quotas for the following year in case any excess is noted. Encouragingly, the Court of Auditors was not able to identify any shortcomings in the reporting of quota uptake, although inconsistencies were noted in the transmission of aggregated fishing data to the EU Commission and the Statistical Office of the European Communities (Eurostat). Reliable data availability is essential for effective fisheries management. Yet the data exchange between Member States and the validation of their own data was shown to be inadequate.[16]

1.4 Spatial monitoring and fisheries reporting duties

The effectiveness of fisheries controls in terms of fishing quotas, effort limits, spatial restrictions, and technical measures is crucial to achieve sustainable stock management and protect marine ecosystems. The reporting obligations of fishermen and the spatial monitoring of vessels both play a key role in this respect. As mentioned earlier, fisheries reporting duties are hierarchised based on the size of fishing vessels. Smaller vessels of less than 10 meters in length are not subject to any reporting duties although they make up the majority (78 %) of the European fleet (82,280 fishing vessels as at 31 December 2015) (see Fig. 1). As regards the German fishing fleet, they made up 67 % of active fishing vessels in the year 2017 (see Tab. 1). Despite the fact that the catches of smaller vessels tend to be rather small compared to the total landings – although some 12 % of the total landings in the Baltic Sea continue to come from vessels of up to 10 meters in length[17] –, they too are relevant for stock management and to gather information on unwanted bycatches.

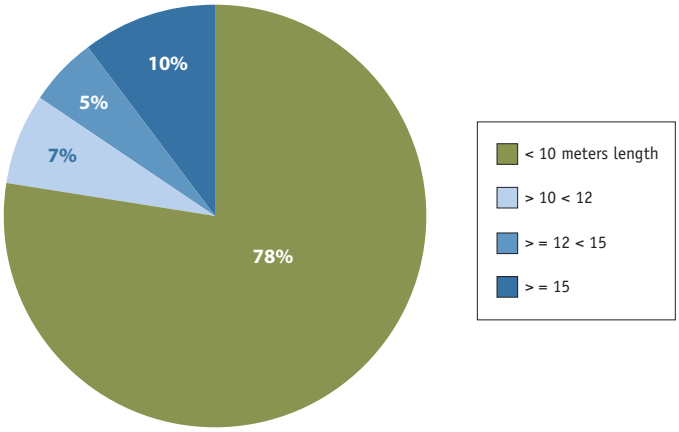

Fig. 1: Composition of the European fishing fleet hierarchised by length category. Source: European Court of Auditors (2017).

Length category	Percentage
< 10 m	67
10–12 m	7,6
12–18 m	13,3
> 18 m	12,1

Tab. 1: Composition of the (active) German fishing fleet in 2017 hierarchised by length category. Source: STECF (2018).

Similar rules apply to the automatic detection of fishing vessels. As mentioned earlier, all vessels of 12 meters or more in length must be equipped with VMS. However, Member States are entitled to also oblige smaller vessels to use VMS – and have done so in the past – or to grant exemptions (see above). VMS is used to automatically transmit data on vessel position, date, time, course, and speed to the fisheries monitoring centre (FMC), for example in order to detect whether fishing vessels are fishing in restricted areas. The EU Court of Auditors found that the Member States they visited correctly used VMS for inspections. Some vessels of more than 15 meters in length (2 %) were not equipped with VMS contrary to the requirements, **while the majority of fishing**

14 *Ibid.*
15 *Deutscher Bundestag (2017).*
16 *European Court of Auditors (2017).*
17 *Deutscher Bundestag (2019).*

vessels of between 12 and 15 meters in length were exempt from the VMS obligation by the Member States. Although the auditors did recognise the need to avoid overburdening fisheries with more rules, they still criticized the large gap in fisheries controls resulting from this practice which makes effective monitoring of (seasonal) fishing restrictions and/or bans imposed on certain areas almost impossible to achieve and very difficult to put into practice. Also, it is difficult to determine whether exemptions for vessels of between 12 and 15 meters in length that remain at sea for not more than 24 hours or only fish in territorial waters are in fact legitimately granted. Last but not least, it is hardly possible to effectively monitor fishing effort restrictions or cross-check catch levels against fishing times, activities, and areas. Together with the limited reporting duties, this makes the monitoring of compliance with allocated quotas or days at sea as well as technical requirements particularly difficult.[18]

Incomplete and wrong catch data threatens fish stocks

As outlined above, Member States are obliged to monitor the catches of fishing vessels not subject to reporting duties, and verify the information transmitted by fishing vessels subject to reporting duties, including VMS data. This information is particularly important to determine catch levels, which serve as a basis for the preparation of scientific advice, including the determination of fishing pressure. **The European Court of Auditors found that primarily catch data – including reported landings – for smaller vessels not subject to, or exempted from, electronic data transmission requirements tended to be incomplete and/or incorrect.**[19] It was further noted that a large number of fishing vessels – including those of more than 12 meters in length – continue to register their

Lacking data of fishing activities from vessels of up to 10 meters in length (representing 67 % of German fishing fleet)

catches and landings in paper form, thus significantly increasing the risk of errors. It is generally important that the relevant data be comparable across Member States and provided on a timely basis. The Member States take different approaches to retrieve catch data for smaller fishing vessels. For example, France and Scotland require these fishers to complete a simplified form of the fishing logbook, while Italy uses indirect information not based on risk analysis.[20] The above-described gaps in catch data transmission for small-scale fisheries were noted by other institutions, too, including the European Commission.[21,22,23,24,25] **Against this background, the European Court of Auditors recommends that Member States improve data collection and data verification for smaller fishing vessels[26], notably by abolishing the option to exempt vessels from electronic data transmission and developing alternative technical solutions for easy use by smaller vessels.**[27] Hence, German fisheries were provided with an app (the so-called „Mofi-App“ or Mobile Fisheries Log) for uncomplicated transmission of catch data.[28] However, introduction of the app

18 *European Court of Auditors (2017).*
19 *Ibid.*

20 *Ibid..*
21 *European Commission (2017).*
22 *Parliament (UK) (2017).*
23 *European Parliament (2016).*
24 *Federal Ministry of Food and Agriculture (2017)*
25 *CFFA et al. (2018).*
26 *European Court of Auditors (2017).*
27 *See also Federal Ministry of Food and Agriculture (2017).*
28 *Federal Institute for Agriculture and Food (BLE) (undated).*

met with resistance from fishermen, despite the bonus granted to app users of being permitted to continue fishing in a certain area during a seasonal ban on cod fishing.

1.5 Catch data recording in recreational fisheries

To date, recreational fisheries are under no obligation to record their catches. Member States are merely asked to document the latter on the basis of samplings plans where case stocks subject to recovery plans are affected (Article 55(3) of Regulation No. 1224/2009). There is evidence that in special cases, recreational fishing may account for a substantial part of the fish taken. For example, in the three cod stocks and two eel stocks under study, removals by recreational fishing made up 21 and 72 % of total catches, respectively[29,30] i.e. quantities that play an important role in stock management. Therefore, wherever stocks subject to catch limits are affected, vessel masters must be obliged to document their fishing activities at sea.[31]

1.6 Monitoring marine protected areas

The monitoring of marine protected areas (MPAs), in which fishing is restricted or banned, is made much more difficult by exemptions from the requirement for onboard VMS. For this reason, there is an urgent need to examine whether the requirement can be extended to smaller vessels.[32,33] There is a second problem here: The prescribed frequency of data transmission every two hours is too broad to permit small-scale monitoring of MPAs. Environmental associations therefore propose the shortening of the current interval for the frequency of data transmission to a maximum of 30 minutes.[34] According to Article 22 of Commission Implementing Regulation (EU) No. 404/2011, the fisheries monitoring centers may require that information be transmitted at shorter time intervals. **The final recommendations for fisheries management in the marine protected areas within the German EEZ in the North Sea subject to fishing restrictions – including the surrounding alarm zone – published by the German government stipulate more frequent data transmission (every 30 minutes). Moreover, only vessels equipped with onboard VMS shall be permitted to enter the alarm zone and fishing restricted area.[35] While this proposal is to be welcomed, VMS reporting frequency should be decreased to 10-minutes intervals to allow for very small protected areas such as the Amrum Bank to also be adequately monitored.**

Another tool for the monitoring of fisheries management measures is the use of automatic identification systems (AIS). Under the final recommendation regarding fisheries management measures for the Swedish marine protected area Bratten, vessels shall be permitted to transit through the latter provided they are equipped with AIS. The AIS shall transmit the fishing vessels' position every 30 seconds.[36] **It should be examined whether this would also be a suitable tool for the control of German marine protected areas, especially those that are small in size.**

1.7 Inspections

According to Article 5 of the Fisheries Control Regulation, the Member States must establish a functioning inspection system. To this end, Member States are required to provide appropriate structures and resources and draw up a risk-based inspection scheme. All inspection activities are to be uploaded to a database (Article 78 of Regulation No. 1224/2009). Evaluations of all inspections carried out since 2009 show that their numbers steadily increased until the year 2016.[37] This was particularly the case for inspections on land and less so for inspections carried out at sea.

The assessments carried out by the Court of Auditors showed that, with minor exceptions, Member States planned inspections well. However, the auditors negatively noted that inspectors often did not have access to information when on the spot, making it difficult to cross-check data. In some cases, data access was even missing for the preparation of inspections. Further, the Court of Auditors sees a need for improvement in the standardisation of control procedures and in the preparation of reports and their upload to the relevant national inspection database.[38]

For all these reasons, the EU Court of Auditors recommends that in the future the Member States should be required to use the Electronic Inspection Report System (EIR) proposed by the European Fisheries Control Authority (EFCA, see below).[39]

29 *Hyder, K. et al. (2017).*
30 *Radford, Z. et al. (2018).*
31 *CFFA et al. (2018).*
32 *See also European Court of Auditors (2017).*
33 *CFFA et al. (2018).*
34 *Ibid.*
35 *German Federal Government (2018).*
36 *https://fiskeristyrelsen.dk/media/8997/final_joint_recommendation_bratten.pdf*
37 *EFCA (2017).*
38 *European Court of Auditors (2017).*
39 *Ibid.*

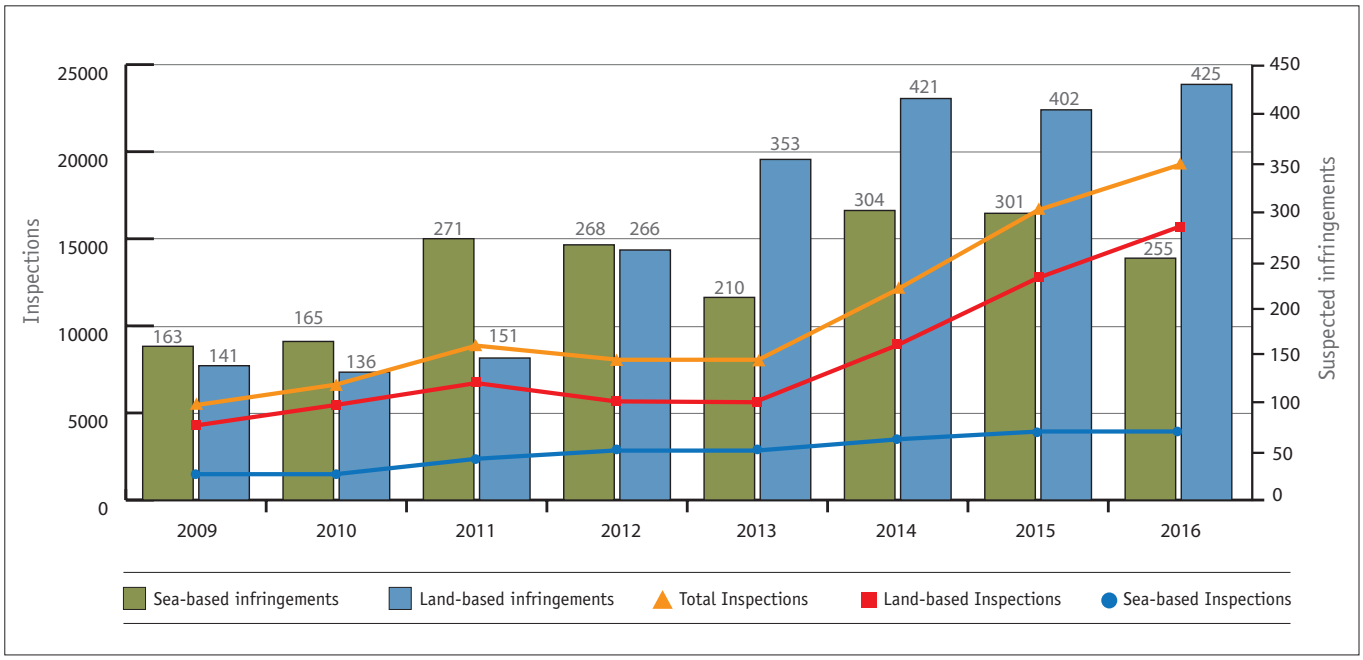

Fig. 2: Development of inspections (land- and sea-based) and infringements in European fisheries between 2009 and 2016. Source: EFCA (2017).

1.8 Monitoring landing obligations

In 2015, the Fisheries Control Regulation was brought in line with the newly introduced landing obligation.[40] Under the amended regulation, the masters of fishing vessels are required to document the landings of all fish below the minimum reference size, as well as all discards above 50 kilograms of species subject to a landing obligation. Apart from some exceptions, all catches of undersized fish need to be separately stowed and, following landing, separately stored. Member States must ensure that all catches of fish below the minimum conservation reference size and subject to a landing obligation are used for purposes other than human consumption. In order to monitor the applicable landing obligations, Member States may deploy control observers onboard fishing vessels flying their flag. In addition, the sanctions scheme was adjusted to cover infringements of the landing obligation. Thus, existing measures were adjusted, but no new measures were introduced.

Many non-target species in cod fishery

Comprehensive monitoring of the landing obligation and its many exceptions has proven very difficult.[41] The use of video technology and cameras on board vessels stands out as an effective monitoring tool, especially since at-sea monitoring

40 *Regulation (EU) 2015/812.*

41 *SRU (2011).*

by onboard control observers is costly and difficult to put in to practice and other measures such as plausibility checks are less reliable. In 2011, therefore, the German Council of Environmental Advisors (Sachverständigenrat für Umweltfragen – SRU) recommended that monitoring be carried out by means of video technology on board fishing vessels.[42] Another option, particularly suitable for smaller fishing vessels, is the electronic transmission of a series of other data, for example data recorded by sensors. Even more effective would be a combination of both these datasets. Remote electronic monitoring (REM) systems could be used for data collection and transmission.[43] The German Federal Government also recommends the use of this technology for the monitoring of the landing obligation since in the Baltic Sea too, cod fisheries continue to exhibit high discard rates for juvenile fish and major discrepancies between logbook entries and scientific estimates (Chapter 2.5.5).[44,45,46] **The European Commission also sees clear indications for poor implementation of the landing obligation.[47] The extent to which the collected data, including video footage, will be justiciable remains to be established.**

In Germany, changes to fisheries controls (including mandatory checks of the catch composition of the last haul) were initially triggered by the introduction of the landing obligation. Additional monitoring tools are being discussed within the framework of the regional bodies for the North Sea and the Baltic Sea (Scheveningen and Baltfish). As part of its „Catch Quota Management Trial 2012 – 2014" project, the Thünen-Institut tested the use of REM systems (featuring a combination of sensor and video data) on two trawlers.[48] While the results were positive in terms of practicability, data transmission and evaluation proved to be rather difficult.[49]

1.9 Monitoring bycatches of protected species (esp. marine mammals and seabirds)

The Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEZ) requires the Member States to monitor all incidental bycatches of species listed in Annex IV, including various marine mammals. The Birds Directive (2009/147/EC) stipulates the same for seabirds. Further recommendations and obligations are based on the work of both the OSPAR and the Helsinki Commission (HELCOM).[50,51] In Germany, such a monitoring scheme is to be established as part of the implementation of the Marine Strategy Framework Agreement.[52] Moreover, it is required that the biodiversity criterion D1C1 (bycatch esp. of marine mammals, seabirds, and non-commercial fish species) be assessed in terms of Good Environmental Status, with the number of drowned marine mammals and seabirds used as indicator. **To date, no such assessments have been made[53], mainly due to the lack of reliable figures on bycatches of marine mammals and seabirds. Similarly, there is a lack of reliable data on the spatial distribution of fishing activities by smaller vessels, in particular those using gillnets and entangling nets (see Chapter 3.4). Hence, the introduction of effective monitoring of all bycatches of threatened or other non-target species must be urgently promoted.**

Drowning in gilllnets – main threat for harbour porpoise populations in the Baltic Sea

1.10 Sanctioning infringements

The Member States are obliged to take appropriate measures if the rules of the CFP are breached. In such cases, consistent and effective sanctions shall be imposed, which shall act as a deterrent and/or be capable of producing results proportionate to the seriousness of the infringement (Article 89(2) of Regulation No. 1224/2009). In addition, administrative and criminal proceedings under national law may be initiated.[54] Further, as mentioned above, a point system was established (Article 92 of Regulation No. 1224/2009) and a pertaining list of serious infringement drawn up by the EU Commission.[55]

42 *Ibid.*
43 *Bergsson H. et al. (2016).*
44 *Federal Ministry of Food and Agriculture (2017).*
45 *Deutscher Bundestag (2019).*
46 *Deutscher Bundestag (2017).*
47 *European Commission (2018).*
48 *Götz S. et al. (2015).*
49 *Deutscher Bundestag (2017).*
50 *HELCOM Recommendation 17/2.*
51 *OSPAR Commission (2009).*
52 *German Federal Ministry for the Environment, Nature Conservation, Building and Reactor Safety (BMUB) (2014).*
53 *German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (Ed.) (2018).*
54 *See also SRU (2011).*
55 *Commission Implementing Regulation (EU) No 404/2011.*

Along with the number of inspections, the number of detected infringements steadily increased between 2009 and 2016.[56] Breaches mainly consisted of incorrect logbook entries, regarding for example the quantities landed, and of using banned or illegal fishing gears.

In accordance with the principle of subsidiarity, each Member State is responsible for determining its own level of sanctions. The EU Court of Auditors has voiced its doubts as to whether all sanctions imposed have been fit to serve as a deterrent. For example, Scotland issued a lot of warnings and kept the number of fines applied very small. As a result, even though inspection efforts were higher than in other states, the recurrence was greater. Moreover, the point system was not (fully) implemented by all four Member States under study, which means that there was no level playing field.[57,58] Even today, there is still no European register of infringements and sanctions that would enable a more effective risk analysis and enhanced transparency across Member States.[59]

1.11 The role of the EFCA

The European Fisheries Control Agency (EFCA) was established in 2005.[60] Its objective is to organise operational coordination of fisheries control and inspection activities by the Member States and to assist them to cooperate so as to comply with the rules of the Common EU Fisheries Policy. The EFCA shall ensure effective and uniform application of the CFP. A key tool in this regard is the preparation of joint deployment plans covering both European waters and those international waters for which a high priority has been identified. The EFCA also supports the training of instructors and inspectors.[61]

1.12 Proposal by the EU Commission for amendments of the Fisheries Control Regulation and Conclusion

In late May 2018, the European Commission published a proposal for a revision of the Fisheries Control Regulation.[62] The main proposals for amendments are as follows:

- Simplify the control of fishing capacity, including through requiring certain vessels to be equipped with devices for the monitoring and recording of engine power.
- Introduce the mandatory use of an electronic system for inspection reports.
- Provide a new list of infringements of rules of the CFP to be qualified as serious, as well as a list of criteria for the identification of other breaches to be qualified as serious.
- Introduce binding administrative sanctions and minimum fines for serious infringements of rules of the CFP, and clarifications regarding immediate implementation measures in the case of serious infringements and regarding the process of allocating points. Moreover, encourage Member States to better use and exchange data on infringements.
- Establish a requirement for all vessels, including those below 12 meters in length, to carry a monitoring system (not necessarily satellite-based).
- Abolish the exemption of catches of less than 50 kg in weight from reporting in logbooks, and optimize the data to be recorded in logbooks.
- Abolish the possibility for Member States to exempt vessels of between 12 and 15 meters in length from electronic reporting duties. Vessels shall only be differentiated as being above or below 12 meters in length, with the former obliged to electronically record and report their catches. Similarly, current derogations on the landing declaration shall be removed.
- Require Member States to establish a system for the control of recreational fisheries and in particular their catch data. Oblige recreational fishers to submit catch declarations to the competent authorities if species subject to conservation measures are affected.
- Require Member States to effectively monitor the landing obligation. To this end, Member States must determine which vessels need to be equipped with electronic monitoring systems, in particular video surveillance (CCTV), based on risk analysis.
- Other proposed amendments concern procedures for ascertaining traceability, for the weighing of catches, and for the transmission of sales notes and transport documents. Data availability and data exchange shall also be further improved.

Moreover, the EU Commission recommends amending Regulation (EU) No. 768/2005 so as to delegate more powers to the EFCA.

The proposal by the European Commission takes up most of the criticisms voiced by the EU Court of Auditors. For this reason, too, the amendments proposed by the Commission are to be welcomed.[63] Ideally, the German Federal Government should support the EU Commission's proposal. Without going into further detail, the German position paper published as part of the consultation process gives grounds for optimism.[64] More ambitious suggestions should be examined, such as the establishment of a European fisheries control data center, or the definition of minimum requirements for the spatial monitoring of marine protected areas.[65,66]

56 *EFCA (2017)..*
57 *European Court of Auditors (2017).*
58 *European Commission (2017).*
59 *European Court of Auditors (2017).*
60 *Regulation (EC) No. 768/2005..*
61 *For more information, see EFCA (undated)*
62 *European Commission (2018).*
63 *See also European Parliament (2016)..*
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4 Probst, N. (2014): K28 VMS - Das Ding mit dem Ping. Fischerblatt 62 (9), p. 18–21.

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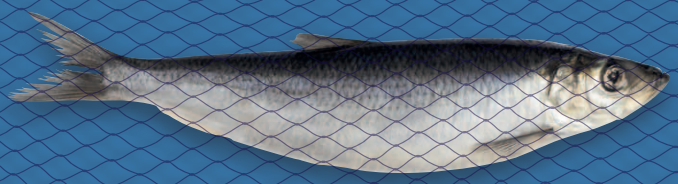
SECTION 4 | INTERPLAY OF THE CFP WITH THE MARINE STRATEGY FRAMEWORK DIRECTIVE



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Authors

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CHAPTER 4 | INTERPLAY OF THE CFP WITH THE MARINE STRATEGY FRAMEWORK DIRECTIVE

1. Interplay of the CFP with the Marine Strategy Framework Directive

1.1 Achievement of "good environmental status" via the CFP

There are many connections between the EU's Marine Strategy Framework Directive[1] (MSFD) and the CFP, starting with the fact that seas that, according to the MSFD's overarching goal, have good environmental status offer the best conditions for healthy ecosystem and fish stocks. Thus several of the MSFD target descriptions, such as those addressing eutrophication or pollution, can greatly improve the conditions for achieving the CFP's management and conservation objectives. The "promise" of the MSFD is in fact to make a contribution to sustainable fisheries by ensuring holistic management of all interactions between humans, the environment, and the economy in the marine environment.

In Section 1, the central goal of the reformed CFP, management of fish stocks in a manner consistent with the maximum sustainable yield is examined. Deviating from the internationally valid target of achieving this goal by 2015, the reformed CFP stipulates "by 2020" as the timeframe. The reason for the extended deadline is that the 2008 MSFD[2] referred to a target date of 2020 even before the CFP reform. With a common target date for the regulatory interface, both instruments (the basic CFP regulation and the MSFD) should be implemented in a synchronized manner.[3] Environmental and fisheries policies that are meshed as closely as possible underscore the EU's legislative claim to integrated, comprehensive marine protection incorporating ecologically sustainable fish stock management and minimization of negative impacts on marine habitats and species that are not targeted by fishing, but suffer collateral damage or impairment.

1.1.1 "Good environmental status" according to the MSFD

According to its preamble, the basic CFP regulation "*CFP should contribute to the protection of the marine environment, to the sustainable management of all commercially exploited species, and in particular to the achievement of good environmental status*". "*Good environmental status*" means "*the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations.*"[4]

Among other things, this means that species living in the seas and their habitats are protected, anthropogenic reduction of biodiversity is prevented, and the various biological components are in balance.[5] "Good environmental status" is thus related explicitly to the impacts of anthropogenic activity, namely fisheries, on the marine environment.

According to the MSFD targets, the EU Member States are obliged to achieve "Good environmental status" in their marine waters by 2020.[6] The geographical reference is the marine waters under the sovereignty of Member States, including the Baltic Sea and the Greater North Sea.[7] Specifically, the MSFD obliges the EU to develop strategies that aim at clean, healthy, productive seas. Eleven qualitative descriptors serve to define good environmental status at a regional level. They relate to biological diversity, non-native species, commercially exploited fish and shellfish, elements of marine food webs, eutrophication, the condition of the seabed, changes to hydrographic conditions, concentration of contaminants, contaminants in fish and seafood for human consumption, marine litter, and the introduction of energy, including underwater noise.[8]

Using the eleven descriptors, the EU Member States must, in the first few years of MSFD implementation (until 2016) evaluate the status of their marine waters in successive process steps, describe the characteristics of good environmental status for each marine region, determine a comprehensive set of environmental targets, prepare coordinated environmental programmes to continuously evaluate the environmental status of their marine waters, develop programmes of measures to achieve and maintain good environmental status for individual marine regions, and ensure that those programmes are operational.[9] The MSFD is currently in its second implementation cycle.

1 *European Parliament/Council (2008).*
2 *Ibid*
3 *E. Penas Lado (2016), p. 312.*
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6 *Ibid., Art. 1. Para. 1.*
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8 *Ibid., Annex 1.*
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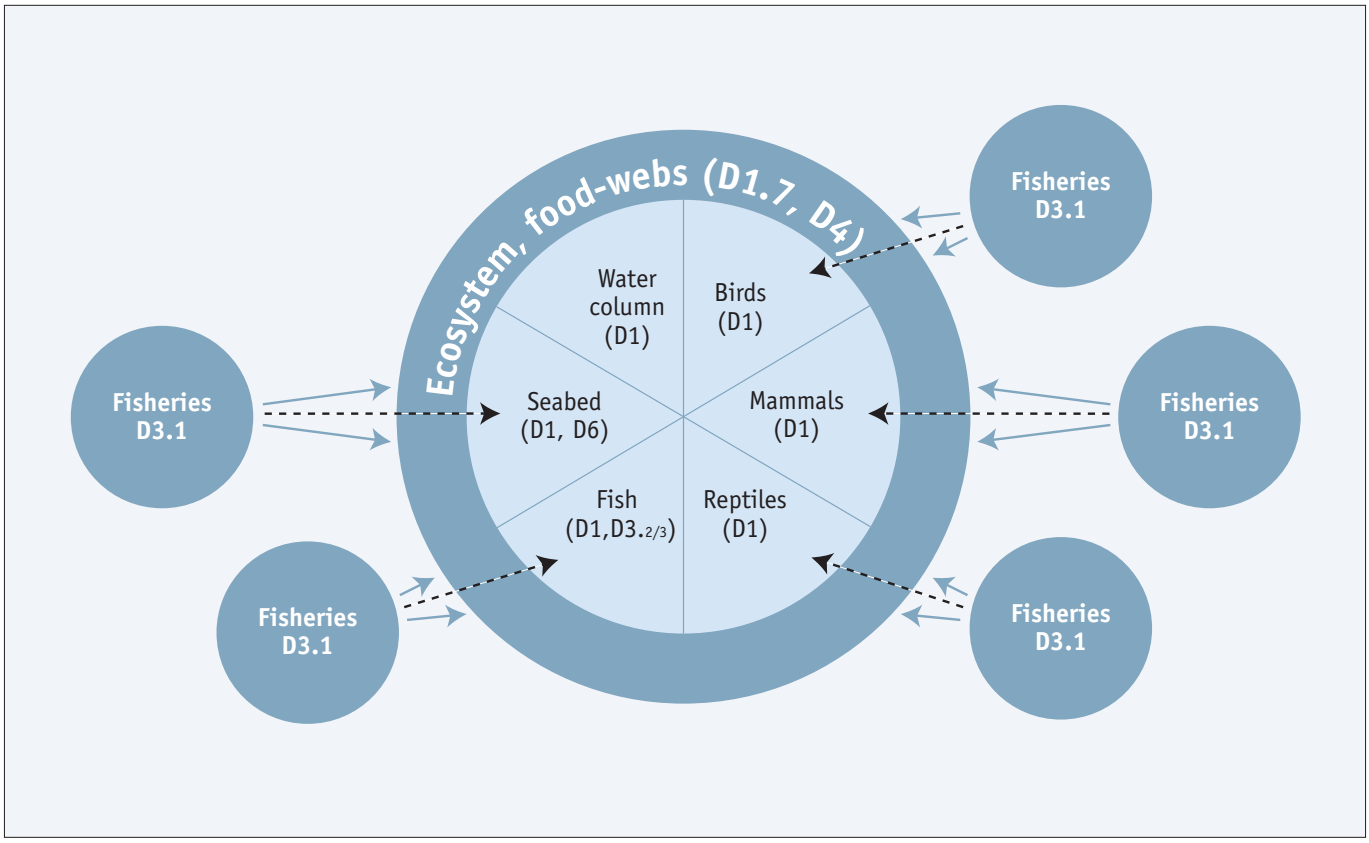

Fig. 1: MSFD status descriptors with respect to fisheries pressure. Source: ICES (2015), p. 8.

Fig. 1 shows that fisheries apply pressure to almost all elements of marine ecosystems. This includes physical damage to habitats on the seabed and unintentional killing of birds or marine mammals, especially due to bycatch, and the reduction of biodiversity or food sources for other fish-eating animals.

Biological diversity 1.	Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic, and climatic conditions.
Population of commercial fish/ shellfish 3.	Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
Elements of marine food webs 4.	All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.
Sea floor integrity 6.	Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.

Fig. 2: MSFD descriptors that are overwhelmingly (Descriptor 3) or partially (Descriptors 4, 1, 6) to be implemented within the framework of the CFP. Source: OSPAR, https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/introduction/policy-context/ (icon source)

Four MSFD descriptors are relevant for the CFP: **While Descriptor D3 forms a qualitative stipulation for the stock conservation target according to Art. 2.2 of the CFP** and is overwhelmingly to be implemented within the framework of the CFP, **three other descriptors (Descriptors D1 biological diversity, D4 marine food webs, D6 seabed integrity) are to be considered within the framework of the CFP**. Achieving the targets of Descriptor D3 also makes a significant contribution to implementing Descriptors 1 and 4. However, it does not meet all the requirements of the MSFD. Thus in the area of the CFP, care should be taken to ensure that good environmental status can be achieved for the relevant ecosystem components according to the MSFD, especially with respect to marine birds and shorebirds and marine mammals. Given that fisheries are responsible for significant physical impairment of benthic habitats due to the use of trawls, this complex of problems is also to be addressed with regulations within the framework of the CFP (Descriptor 6).

Reef habitats are endangered by trawl fishing. Dead man's fingers (Alcyonium digitatum) and frilled anemone (Metridium senile)

1.2 Good environmental status of commercial fish stocks

Descriptor 3 shows a very close relationship to the CFP and especially to the core task of determining annual total fishing levels. It combines the complete implementation of the CFP sustainability goals with the achievement of good environmental status for all commercial fish stocks according to the MSFD. Good environmental status with respect to these descriptors has been described uniformly for the Baltic and North Seas. It has been achieved when

"for all commercially exploited fish and shellfish populations (...) the fishing mortality rate is not greater than the relevant target value (F_{MSY}), the spawning stock biomass (SSB) is greater than $B_{MSY\text{-}trigger}$, and the stocks of exploited species exhibit an age and size structure that continues to include all age and size classes approximating natural proportions."[10]

The assessment of good environmental status within the framework of Descriptor 3 relates to "extraction of, or mortality/injury to, wild species, including target and non-target species".[11] This includes non-target catches. Even though Descriptor 3 addresses only commercial fish stocks, this definition of the pressure relevant for assessing good environmental status expresses interplay with Descriptor 1, since it refers to wild species.

According to the relevant EU Commission decision (Decision 2017/848)[12], Descriptor 3 encompasses three criteria:

Criterion D3C1 deals with sustainable use in harmony with long-term yield:
This criterion affects extraction (that is, fishing). It says that **fishing mortality rates of populations/stocks of commercially fished species may not be above the level at which maximum sustainable yield (MSY) can be achieved**. The assessment is made within the framework of geographical parameters established in the CFP, that is, on the basis of ICES areas applicable to EU stocks – those areas to which the scientific stock assessments also relate. The implementation mission within the framework of the CFP is to ensure that, during the annual establishment of total fishing levels, the threshold value of F_{MSY} is not exceeded for each stock.

Criterion D3C2 requires that fish stocks can be completely reproduced. The criterion refers to the status of commercial fish stocks. It is fulfilled if the **spawning stock biomass of populations/stocks of commercially fished species are above the biomass level at which maximum sustainable yield (MSY) can be achieved**. The CFP implementation order is to establish catch limits so that spawning stock biomass (SSB) is kept above the biomass reference value BMSY.

Criteria D3C1 and D3C2 are reflected in CFP target formulation (Art. 2 Para 2 of the basic regulation). The assessment standard for the stocks managed within the CFP framework is the ICES recommendations for each stock compared with the total fishing levels agreed upon by the Council as part of the annual establishment of fishing opportunities.

Criterion D3C3 ultimately relates to the **age and size distribution of the population/stock**. The good health of the stock within this meaning is manifested in a **high proportion of old/large specimens and limited impacts on genetic diversity resulting from management**. In many stocks, high productivity can be ensured only if so-called "large spawners" (that is, especially large and correspondingly old specimens) are excluded from extraction. It is often just these large fish that are important for

10 *European Parliament/Council (2008), Annex I*
11 *European Commission (2017), Annex I.*
12 *Ibid.*

the population structure.[13] Their permanent extraction influences stock development and can even reduce genetically determined growth potential.[14] There is no implementation mission for this criterion because the necessary evaluation tools are still being developed by ICES, as the Commission stated in its Decision 2017/848.[15] It is urgently necessary that the development and operationalization of this criterion be accelerated so that all Descriptor 3 criteria can be integrated into the assessment of good environmental status.

1.2.1 Procedure for implementing Descriptor 3 as part of the CFP

Because the EU is exclusively responsible for conservation measures as part of the CFP (Art. 3 Para. 1 d) of the TFEU), criteria D3C1 and D3C2 can be fulfilled only as part of the establishment of fishing opportunities on the basis of Art. 43 Para. 3 of the TFEU and the basic CFP regulation. They are congruent with the sustainability goal formulated in Art. 2.2 of the CFP. It is uncertain whether the Commission and the Council, in their use here of an abbreviated legislative procedure without the involvement of the Parliament, are at all conscious of the implementation responsibility. Establishing fishing opportunities based on Commission proposals is the task of the Council.

Despite very extensive recitals, the annual regulations governing fishing opportunities make no reference to the MSFD or to subsequent decisions regarding its implementation. Reference is made to Art. 16 Para. 4 of the basic CFP regulation, which requires that catch limits be established according to Art. 2 Para. 2 of the CFP.[16] Indirectly, this establishes a relationship to the MSFD.

However, in establishing fishing opportunities since the current basic regulation came into force in 2014, the Council has made insufficient progress in bringing the quotas into harmony with scientific recommendations, which are in line with Art. 2 Para. 2 of the CFP, and thus in fulfilling the first two criteria of the MSFD's Descriptor 3. **For the fishing opportunities for 2019, 41% of the quotas (45 of 110) were too high to meet CFP or MSFD targets.**[17] **It is thus extremely unlikely that the MSFD targets with respect to fishing mortality rate and spawning stock biomass can be achieved, which violates the binding targets of the MSFD and the CFP.**

1.2.2 Deficits in implementing Descriptor 3

In December 2018, the German federal government submitted an update to the status assessment for the areas of the Baltic and North Seas for which Germany is responsible.[18] Good environmental status of commercially exploited fish stocks is currently assessed based solely on the first two Descriptor 3 criteria. The third criterion remains neglected because no indicators or assessment limits have been agreed upon.

With respect to fishing mortality rate evaluation (criterion D3C1) and spawning stock biomass (criterion D3C2), the assessment is based on the annual ICES stock analysis. Overall environmental status is considered "good" only if both criteria are fulfilled.[19] For stocks in German Baltic Sea and North Sea waters managed by the EU within the framework of the CFP, there is a very mixed picture:

Of the Baltic Sea stocks for which annual total fishing levels are established, only two (sprat and western plaice stocks) have good environmental status.[20] Two of the most important commercially exploited fish stocks – the eastern cod stock and the western Baltic Sea spring spawning herring stock – are even outside safe biological limits, meaning that they are far from reaching the MSFD and CFP management goals. For twelve stocks not managed by the EU (meaning that no total fishing levels are being established), there is insufficient data for assessment. According to the German Federal Ministry for the Environment report (Fn. 26), new assessment methods for stocks for which there is little data are to be developed to close these gaps in evaluation.

The assessment of North Sea stocks shows that of twelve stocks with ICES evaluations, seven (sprat, plaice, one sand eel stock, herring, dab, turbot, and lemon sole) had good environmental status at the time they were assessed.[21] For seven other stocks, data was insufficient. The example of North Sea herring, whose spawning stock biomass has been fluctuating greatly for ten years, shows that assessments returning good environmental status are sometimes more a snapshot than a permanently positive classification. Even though Criterion D3C1 has for many years been described as fulfilled for this stock (including in the 2018 German status report), the herring lost this status with the establishment of the 2019[22] fishing levels: The total fishing level set here was 32% higher than the F_{MSY} value recommended by ICES, which is why it is unlikely that the MSFD's legal targets will be achieved for this stock. The achievement of good environmental status for fish stocks can be ensured only if fisheries and conservation targets are strictly adhered to when total fishing levels are established.

13 *Uusi-Heikkilä, S. (2017).*
14 *Ibid.*
15 *European Commission (2017).*
16 *See for instance the Council of the European Union (2019).*
17 *Pew (2019), see Section 1.*
18 *Can be viewed at: https://www.meeresschutz.info/berichte-art-8-10.html*
19 *BMU (2018, 1), p. 30.*
20 *BMU (2018, 1), p. 30.*
21 *BMU (2018, 1), p. 30.*
22 *Council of the European Union (2019).*

Herring (Clupea harengus) – the total fishing level in the North Sea is 32% higher than what has been scientifically recommended

Eutrophication of endangered fish and shellfish

For most stocks that are currently classified as having good environmental status, the fishing mortality rate is currently too high. It is imperative that the responsible ministers in the Council adhere to the legal MSFD and CFP targets when they establish catch limits. Important assessment tools (criteria, limits) that would allow implementation of Descriptor D3, and especially its third criterion, are still not in place. These assessment methodologies will be developed for criterion D3C3 over the next few years.[23] The remaining assessment gaps should be closed by developing new classification methods for stocks for which there is little data.

In addition to overfishing, eutrophication of marine waters is another great anthropogenic pressure that endangers the good status of commercially exploited fish and shellfish: This is true of 100% of Baltic Sea and 55% of North Sea areas, and there is no conclusive assessment for 39% of the North Sea. Eutrophication can negatively impact populations/stocks via poisonous algae blooms and oxygen deficiency situations and is a significant cause of biodiversity loss, especially in the Baltic Sea. These negative impacts would be just as easy to correct as those of overfishing – primarily via relevant regulation of agriculture. Input-reduction measures are urgently necessary.[24]

1.3 Deficits in implementing Descriptors 1, 4, 6 as part of the CFP

The German federal government's status reports show that in both the Baltic Sea and the North Sea, a large proportion of marine birds and shorebirds (35% and 45%, respectively) have poor status. In North Sea waters, the pressures contributing to this situation include the disturbance and loss of habitats due to bottom trawling and changes in availability of food associated with fisheries. In Baltic Sea waters, increased mortality due to gillnet fishing near the coast is the primary negative impact on the marine bird and shorebird status.

Of the calls for action formulated in these reports, several can be implemented only within the framework of the CFP. They should be heeded as fully and completely, as quickly as possible. Emphasis should be placed on the necessity of creating places for birds to rest and using fish stocks (such as sprats and sand eels) in an ecosystem-appropriate manner which, in addition to their importance for fisheries, also serve as a source of food for marine birds. Industrial fishing should be prohibited in bird reserves in order to preserve the availability of food for the marine birds there. Moreover, harbour porpoise populations do not have good conservation status in either of the two regional seas. So far, no effort has been made in the reformed CFP to prohibit non-target catches by professional fishing, especially those from gillnets and entangling nets, or to create areas for animals to rest and be protected from anthropogenic disturbances.

The previous implementation of the CFP fails to give sufficient consideration to biodiversity beyond fish stocks or to food webs. Any measures to implement the calls for action mentioned above that relate to the MSFD targets beyond stock conservation are to be adopted within the framework of the procedure described in Art. 11 of the basic CFP regulation (see analysis in Section 2).

23 Cf. ICES (2015).
24 SRU (2015).

Moreover, Descriptor 6 requires seabed integrity that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected. **The most recent German federal government assessments of North Sea environmental status confirm that the greatest physical impacts on benthic habitats arise from bottom trawling, which is conducted across the entire area. The primary call for action is for measures to regulate impacts on the seabed and benthic organisms caused by bottom trawling in order to achieve good environmental status.**

Bottom trawler with beam trawls: Disturbing the seabed results in high bycatch rates

As part of regionalization, the CFP refers decisions on specific measures to deal with the environmental impacts of fishing activities on seabed habitats to the regional level (that is, to the group of Scheveningen states) by means of the future regulation on technical measures that allow measures for fish stock management to be proposed so that habitats can be protected and non-target catches of strictly protected species reduced without a negative impact on their conservation status (see Section 2). These states are thus obligated to prepare proposals for reducing bottom trawling that meet the requirements of Descriptor 6.

1.4 Application of ecosystem-based fisheries management in the CFP

Ecosystem-based assessment of stock conservation begins with any addition to stock management of ecosystem considerations that go beyond managing individual species. A broad understanding necessitates inclusion in the biological fisheries assessment of fish stocks a systematic consideration of all interactions within the food web and environmental changes that arise.[25] The ecosystem approach in fisheries management is therefore a flexible concept or, as E. Penas Lado expresses it, something that everyone thinks is good but that means something different to each person.[26]

1.4.1 Definition

The ecosystem approach for the management of human activity with impacts on the marine environment is a significant component of the legislative framework created because it integrates the concepts of environmental protection and sustainable use (Art. 4 of the CFP). An important proviso for implementation is that Member States must cooperate in a regional context in order to ensure optimal coherence with joint measures given the cross-border character of the hazards for the marine environment. Cooperation is therefore engaged in as part of the Regional Sea Conventions for the marine waters of the EU Member States; in Germany's case, the relevant conventions are OSPAR (for the North Sea and the North-East Atlantic) and the Helsinki Convention (for the Baltic Sea). With respect to fisheries, there is a parallel in the CFP's regionalization approach (see Section 2).

In EU policy, the ecosystem approach arises from the sixth Environment Action Programme of 2002, which relies on the Convention on Biological Diversity ratified ten years earlier for the design of its contents.[27] The MSFD does not itself define the ecosystem approach, but does require its application in the control of human activity. The application of the ecosystem approach is intended to ensure that overall pressures from anthropogenic activity remain limited to a scope that **is compatible with achieving and maintaining good environmental status while allowing sustainable use of the sea.**[28]

25 *For the issue of scope, cf. Van Hoof, L. (2015), p. 22.*
26 *Penas Lado, E. (2016), p. 241.*
27 *European Parliament/Council (2002)*
28 *European Parliament/Council (2008), Art. 1, Para. 3, and recitals in the preamble.*

With respect to the general goals of fisheries management, especially those of conserving and restoring fish stocks, two overriding categories of ecosystem considerations are relevant:

» one is the **negative impacts of fishing activities on the ecosystem** which can impair provision of important ecosystem goods and services for economic operators, other stakeholders, and society as well as hinder restoration of fish stocks with respect to sustainability and environmental targets;

» the other is the **influence of the greater ecosystem on fisheries**, which blends with the consequences of fisheries, possibly exacerbating them, and moreover may impede or facilitate the restoration of fish stocks.[29]

The CFP itself, on the other hand, provides a target that relates primarily to the ecosystem damage caused by fisheries: "The CFP shall implement the ecosystem-based approach to fisheries management so as to ensure that negative impacts of fishing activities on the marine ecosystem are minimized, and shall endeavour to ensure that aquaculture and fisheries activities avoid the degradation of the marine environment." (Art. 2 Para. 3 of the CFP).

The **primary goal** of CFP implementation is thus the **greatest possible reduction of negative fisheries impacts on the marine ecosystem. On the other hand, avoiding deterioration of the marine environment caused by aquaculture or fisheries activities is formulated merely as something to be striven for**. A measure that degrades the environmental status of the seas but whose negative impacts have been minimized would thus still be compatible with the CFP target. The formulation of the general **CFP target with respect to the ecosystem approach** thus not only is constricted with respect to content, but also **directly contradicts the MSFD, which requires compatibility of human activity with the achievement and maintenance of good environmental status**.

Art. 4 of the CFP regulation provides a more precise definition of the "ecosystem-based approach in fisheries management". It contains the only legal definition of the ecosystem approach anywhere in EU law. It says that the approach is "an integrated approach to managing fisheries within ecologically meaningful boundaries which seeks to manage the use of natural resources, taking account of fishing and other human activities, while preserving both the biological wealth and the biological processes necessary to safeguard the composition, structure and functioning of the habitats of the ecosystem affected, by taking into account the knowledge and uncertainties regarding biotic, abiotic and human components of ecosystems".

The core matter of ecosystem-based fisheries management is thus adherence to sensible ecological limits (corresponding to Descriptor 3 of the MSFD) where other human activity must be considered in addition to fishing activity, and biological diversity, including the affected ecosystem's biological processes, is to be conserved. The latter expansion of the approach to include biological process also expands the field of plausible ecosystem-based measures within the framework of the CFP. It should be noted, however, that the CFP does not target fisheries management as part of a comprehensive ecosystem management scheme, as the MSFD provides for. Instead, it is **traditional fisheries management in an ecosystem context**.[30]

This does not preclude EU fisheries **management incrementally implementing an ecosystem-based approach** by continuously integrating new ecosystem-relevant areas of regulation related to stock management.[31] Such a progressive understanding of ecosystem-based management gives long-term consideration to the circumstance that the complexity and dynamism of ecosystems require adaptive, developing management.[32]

The following groups of measures appear clearly established in the design of the ecosystem approach in the current CFP and implementable as part of existing CFP targets:[33]

29 *S. Garcia, S. M. et al. (2018).*

30 *Van Hoof, L. (2015), p. 25.*

31 *S. Penas Lado, E. (2016), p. 241.*

32 *Already expressed by the European Commission (2008), for instance, referring to work as part of the CBD.*

33 *Cf. Probst, N. (2013); Penas Lado, E. (2016), p. 242.*

MEASURES IN CONJUNCTION WITH DETERMINING FISHING LEVELS:

- Regulation of exploitation of commercial fish stocks with respect to stock biomass, fishing mortality rate, and age composition of the target species populations;
- Consideration and integration of information about dependencies between species, fisheries, and other components of the ecosystem;
- Special consideration of the availability of food for other fish, marine birds, and marine mammals.

OTHER MEASURES WITHIN THE CFP AREA OF APPLICATION:

- Regulation/proscription of bycatch discards with respect to stock biomass, fishing mortality rate, and age composition of the target species populations;
- Limitation of the use of bottom trawling gear with a view to the damage, some of it great, to sensitive organisms and habitats on the seabed;
- Limitation of fishing and mandated use of alternative fishing gear for avoiding inadvertent non-target fish, marine bird, or marine mammal catches;
- Protection of species and habitats and implementation of other parts of the MSFD according to the conservation requirements of Member States and the prerequisites of Art. 11 of the CFP.
  (See Section 2 above.)

1.4.2 Prospects of operationalization within the framework of the CFP

The operationalization of the ecosystem approach as part of the EU's fisheries stock management is a process that began with the 2013 CFP reform, but has had a firm legal and political framework only since the establishment of the basic CFP regulation.[34] ICES plays a central role in the implementation of ecosystem-based fisheries management in the CFP, even though many ICES recommendations have not conformed to the ecosystem approach in the past. The Commission's current agreement with ICES[35] is that ICES will supply recommendations on fishing opportunities in the context of the ecosystem approach. These recommendations will conform to the goals that the relevant EU policies (CFP and MSFD) have established. Ecosystem considerations can be expressed in ICES scientific recommendations primarily in three products:

1. **In the fishing opportunity recommendations**

   According to the ICES mission, the ecosystem approach is to be implemented incrementally within the framework of the stock-related fishing opportunity recommendations. The recommendations are based on the design of the stock conservation goals in the basic regulation and, as applicable, on the special provisions of the agreed-upon multiannual regional plans. Ecosystem considerations can be taken into consideration, especially in establishing reference values for individual stocks.

2. **In the regional ecosystem overview reports**[36]

   These overview reports contain a description of the ecosystems, identify the most important human pressures, and explain how they affect central ecosystem components.

3. **In the regional fisheries overview reports**[37]

   Fisheries overview reports summarize fisheries activity in the ICES ecoregions, including information about which Member States catch what species, what fishing methods are used, and how regional stocks are managed.

The regions for which there are regional overview reports as described include the North Sea and the Baltic Sea. The information they contain "is to support the fishing opportunity recommendations". Systematic integration of this information into ICES catch recommendations, however, would require a more specific assignment on the part of the EU for representing management options derived from the insights recorded in the overview reports.[38] The same is true of some other ecosystem-relevant information ICES is tasked with providing, namely that concerning aspects of mixed fisheries in the individual regions and interactions between fish stocks and marine ecosystems that might be relevant to fisheries management.

34 *Ballesteros, M. et al. (2018).*
35 *ICES-COM (2019), Deliverable 1.1.3..*
36 *ICES Ecosystems Overviews.*
37 *ICES Fisheries Overviews.*
38 *Ballesteros, M. et al. (2018), p. 525.*

Moreover, the ICES mandate extends to the composition of other information that in the mid-term might be very important for implementing ecosystem-based fisheries management, such as information about the impacts of fisheries on marine mammals, marine birds, and habitats. ICES is also to prepare a plan for involving interactions within and between species in the implementation of multiannual plans for the Baltic Sea, the North Sea, and western waters.

While all of these are important pieces of the puzzle that will in future deliver a more comprehensive picture of regional marine ecosystems in the North Sea and the Baltic Sea as well as reveal the complex biological and physical relationships, **ICES's current task illustrates that the EU's ecosystem-based approach to stock management is still early in its development**. It is uncertain whether appropriate conclusions are already being reached with respect to good environmental status from documentation of existing relationships. The determination of specific management goals that comply with the existing regulatory framework (CFP and MSFD) must follow the assessment stage before ecosystem-based management can be said to have been operationalized.[39] Recently, Integrated Ecosystem Assessments (IEAs) have been developed as a formal synthesizing tool for quantitative analysis of information about relevant natural and socioeconomic factors with relation to certain EBM goals.[40] IEAs offer a strategy for overcoming the individual species and individual sector approaches that still predominate. The collected information would then need to be subjected to a quantitative analysis and synthesis with respect to the stipulated ecosystem goals. Suitable computer models can bring about the transition to long-term multi-species management while integrating further ecosystem data into stock management.[41]

Given the CFP's current implementation level and considering ICES's scientific expertise, it is still possible that political or economic considerations determine the distribution of fishing levels in mixed fisheries among stocks that appear together and thus cannot be completely selectively fished. **Multi-species management should be pressed forward with all urgency in the implementation of regional multiannual plans after ICES has drawn up the relevant plan.**

1.5 Monitoring

Monitoring is indispensable for marine ecosystem conservation and ecosystem-friendly management of marine biological resources. It serves to capture the status of the ecosystems, including the species, biocoenoses, and anthropogenic pressures appearing in them, and allows conclusions about whether management measures are necessary and whether specified policy goals have been achieved.[42] The most important obligations for establishing monitoring programmes for marine waters arise from the MSFD, the Habitats and Birds Directives, the Water Framework Directive, and work done to implement regional marine protection conventions (OSPAR and the Helsinki Convention).

The commissions of regional conventions (HELCOM and OSPAR) and the ICES regularly publish reports on the ecological status of marine areas or ecoregions.[43,44,45] Status reports according to the MSFD were prepared in 2012 and must be updated every six years. The first of these updates was in 2018.[46] Relevant monitoring data is used for these reports.

The MSFD obligates Member States to prepare monitoring programmes that take into account determined environmental targets as well as the initial assessment and to operationalize them by 2014 (Art. 11 MSFD). Germany published its monitoring programme at the end of 2014.[47] Because, among other things, this programme exhibits gaps, it is to be re-evaluated by 2018 and updated by 2020. The monitoring programmes Germany has used to meet its various obligations have in the past been coordinated by the federal government/federal state measurement programme for marine environments in the North Sea and Baltic Sea (Arbeitsgemeinschaft Bund/Länder-Messprogramm für die Meeresumwelt von Nord- und Ostsee, or ARGE BLMP) and have come to be integrated into the German implementation of the MSFD. Responsibility for monitoring, including its refinement via continuous adaptation of the monitoring manual, has come to rest with the federal government/federal state working group on the North Sea and Baltic Sea (Bund/Länder-Ausschuss Nord- und Ostsee, or BLANO) (see Table 4.5-1 and https://www.bfn.de/en/activities/marine-nature-conservation/marine-monitoring/organisation-and-requirements.html).[48,49]

39 *Cf., for example, the operationalization process within the framework of NAFO Koen-Alonso, M. et al. (2019).*

40 *Levin, P. et al. (2009).*

41 *See for example Möllemann, C. (2014).*

42 *See the German Advisory Council on the Environment (Sachverständigenrat für Umweltfragen, or SRU) (2012).*

43 *See for instance OSPAR Commission (2017).*

44 *OSPAR Commission (2010).*

45 *ICES (2016).*

46 *BLANO (2018).*

47 *German Federal Ministry for the Environment, Nature Conservation, and Nu clear Safety (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit, or BMUB) (2014).*

48 *Administrative agreement for cooperation between the German federal government and the federal states for marine protection, especially for implementing Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 for establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive, or MSFD).*

49 *Monitoring manual, see https://mhb.meeresschutz.info/de/start.*

As has been mentioned, implementation of a Natura 2000 protection area network in German sea areas is necessary to protect marine species and benthic habitats and thus to achieve MSFD targets (see Section 6.3.4). In these marine protected areas, habitats and species that are significantly endangered by fisheries interventions receive special protection.[50] Monitoring is the foundation for developing management measures for creating and evaluating marine protected areas. This is especially true of marine birds, marine mammals, and reef and sandbank (slightly covered by sea water) habitat types. Moreover, sufficiently large zero-use zones should be set up within protected areas to create representative reference areas whose status is also continuously monitored. This allows documentation and evaluation of changes to other locations caused by fisheries interventions.[51,52]

The German Federal Agency for Nature Conservation (BfN) had the first concept for fulfilling Natura 2000 monitoring and reporting obligations in the offshore areas of the German North Sea and Baltic Sea (*Konzept zur Umsetzung der Natura 2000 Monitoring- und Berichtspflichten in den küstenfernen Gebieten der deutschen Nord- und Ostsee*) published in 2008.[53] This concept calls for monitoring of marine mammals, marine birds, and benthic habitat types and their biocoenoses. For instance, the occurrence of marine mammals (especially harbour porpoise, *Phocoena phocoena*) is recorded via aerial surveys.[54] Resting and migrating marine birds are documented from planes or ships. A regular recording programme has also been implemented for the benthic habitat types in the EEZ. One reason the latter is necessary is to examine the conservation status of reef and sandbank habitat types in the protected areas and assess the necessity of measures for regulating human activity. As soon as management measures have been established, monitoring serves to evaluate their efficiency.[55] According to the Habitats and Birds Directives, the responsibility for monitoring in the German EEZ is with the BfN; coastal federal states are responsible for coastal seas.

Documentation of the occurrence of harbour porpoise and marine birds has improved over the years,[56,57,58] but there are still a number of gaps in knowledge.[59] With respect to the habitat types on the seabed, the current BLMP monitoring manual provides for a specific type of monitoring. For instance, it was determined that benthic species and habitats on the seabed would be analyzed with respect to their distribution, extent, and species communities, such as soft-floor and hard-floor species (fauna and flora).[60] To monitor the risk or hazard posed by fisheries to these biocoenoses and species, reliable data on fisheries activity, especially the place and time of fishing activities, including the nets used, is necessary.

Species-rich gravel, coarse sand, and shell substrate" habitat type with the characteristic species common dragonet (Callionymus lyra)

In addition to monitoring the status of certain species and biocoenoses (see Table 4.5-1), an important task of the monitoring system is to document bycatch of marine mammals and marine birds. This also involves a number of obligations (see, for instance, Art. 12 of the Habitats Directive; Council Regulation (EC) No. 812/2004; ASCOBANS[61]). These data are important for determining the status of these non-target species (see MSFD Criterion D1C1, bycatch).[62] Bycatch is one of five indicators for determining the status of these species groups for which a target or limit value must be stipulated.[63] Gillnet bycatch poses a special hazard to harbour porpoise and marine birds.[64,65,66,67] Relevant bycatch data are necessary for estimating the risk. Only rudimentary data has so far been collected in German marine waters, and the sample size is small and neglects the relevant fleet segments (especially fishing vessels with lengths of less than 12 metres) and métiers (passive fisheries with gillnets and entangling nets).[68] There are obligations to capture this information, especially for large fishing vessels.[69,70]

50 *See, among others, Sell A. et al. (2011).*
51 *SRU (2012).*
52 *SRU (2015).*
53 *Nehls G., et al. (2008).*
54 *For the current status see German Federal Agency for Nature Conservation (BfN) (N.D).*
55 *For the current status of monitoring, see the German Federal Agency for Nature Conservation (BfN) (N.D.).*
56 *See for instance Amundin M. et al. (2016).*
57 *SAMBAH: http://sambah.org/.*
58 *OSPAR Commission (2017).*
59 *HELCOM (2019).*
60 *Meeresschutz.info (2014).*
61 *ASCOBANS (2009).*
62 *European Commission (2017).*
63 *Ibid.*
64 *See, among others, Detloff K. and Koschinski, S. (2017).*
65 *HELCOM (2013).*
66 *Žydelis R. et al. (2013).*
67 *OSPAR Commission (2017).*
68 *Thünen Institute (N.D.).*
69 *ICES (2018).*
70 *Ibid.*

MSFD descriptor	FOCUS OF ANALYSIS
1, 4	Biodiversity – birds
1, 4	Biodiversity – mammals/reptiles
1, 4	Biodiversity – fish/cephalopods
1, 4	Biodiversity – water column habitats
1, 4, 6	Biodiversity – sea floor habitats
2	Non-indigenous species
3	Commercially exploited fish and shellfish
5	Eutrophication
7	Hydrographical changes
8	Contaminants
9	Contaminants in seafood
10	Marine litter
11	Energy, including underwater noise

Tab. 1: German monitoring analysis areas of focus according to the MSFD for the North Sea and the Baltic Sea. Source: https://mhb.meeresschutz.info/de/monitoring/uebersicht

Data is particularly scarce for the Baltic Sea. Among the reasons for this are the high intensity of gillnet fishing from small fishing vessels and the lack of monitoring programmes for recording non-target catches of marine mammals and marine birds. To analyze the effects of the use of mobile bottom trawling gear on benthic habitat types and the bycatch of endangered species, core indicators have been developed within the framework of HELCOM.[71] The CUML ("cumulative impacts of fisheries on benthic habitats") indicator serves to assess implementation of MSFD Descriptor 6 and record the impacts on marine benthic habitats of trawl fishing and other human activity. The "number of drowned mammals and marine birds in fishing nets" core indicator is to be used to evaluated bycatch of endangered species.

The HELCOM working group for fisheries (HELCOM FISH) and the Correspondence Group for fisheries data (EG Fishdata) have identified a number of data deficiencies in this context: detailed information about fishing gear, precise sizes of fishing vessels (especially those under 12 m, for which a vessel monitoring system is not required equipment), high-resolution VMS data, length and width of the trawl strip, and quick availability of the date of fishing activity (see Section 3.4 and Section 6.4.5).[72] The "number of drowned mammals and marine birds in fishing nets" indicator is missing data on bycatch of non-target species. Moreover, the information about fishing effort (such as length of nets used and duration of placement, especially by small fishing vessels) and samples of inadvertently caught organisms (non-target species) has not been adequately collected (see Section 3.4 and Section 6.4.5). Data about fishing effort, including log book entries, VMS data (or AIS data) and entries concerning the last catch serve such purposes as determining fishing intensity using bycatch figures. Bycatch rates can thus be determined for a specific area and used to identify bycatch hotspots. The gaps in information for small gillnet fishing vessels are especially glaring (Section 3.9).[73] Information on individual animals drowned in the nets can be used to determine gender, age, and other characteristics of these animals in order to specify, among other things, what animals are expose to an especially great bycatch risk.

The most important species whose bycatch is to be recorded are harbour porpoise, ringed seal (*Phoca hispida botnica*), grey seal (*Halichoerus grypus*), harbour seal (Phoca vitulina), and all marine bird species, such as black-throated diver (*Gavia arctica*), long-tailed duck (*Clangula hyemalis*), and razorbill (*Alca torda*).[74] A prioritization of species for which relevant programmes are to be initiated must be oriented on the bycatch risk for the specific population. In its relevant working groups (WGBYC), ICES also addresses monitoring bycatch of endangered species and has published information and recommendations on the issue.[75] For instance, the working group has summarized current experience with monitoring whale bycatch and intends to prepare guidelines for on-board sampling. The only truly reliable way to monitor

71 *HELCOM (2018a).*
72 *HELCOM (2018b).*
73 *HELCOM (2019).*
74 *Ibid*
75 *ICES (2018).*

non-target catches is with observers on board ships or electronic monitoring with cameras and sensors (see Section 3.9).[76,77,78]

Reliable bycatch data can be gathered only with strict monitoring

The conclusion is that it is particularly important to establish bycatch monitoring for marine birds and mammals in the Baltic Sea, with priority given to the harbour porpoise, since the intensity of gillnet fishing is very high there; without such monitoring, it will be impossible to achieve the goals of the MSFD and the Habitats Directive. This monitoring should focus on particularly relevant fisheries activity (especially the use of gillnets and entangling nets) and contribute to identifying bycatch hot spots. It is also necessary to employ observers or deploy relevant technology on board ships. The fishermen are responsible for participating actively in establishing a reliable bycatch monitoring system. The dedication of fishermen to contributing to solving the bycatch problem has thus far been weak.[79] Moreover, sufficiently finely scaled data on fishing effort is necessary if an adequate risk assessment is to be undertaken.

1.6 Summary

The failure to achieve the MSFD with respect to various ecosystem elements (fish, marine mammals, the seabed – that is, Descriptors 1, 4, and 6) can be traced back largely to an inadequately implemented or deficient CFP. **There are massive deficits in the establishment of places for marine birds and harbour porpoise to rest where fishing is prohibited. Much more must also be done in increasing selectivity of fishing gear for minimizing negative ecological impacts.**

The necessity of contributing to MSFD implementation by establishing annual fishing levels is not among the recitals for the regulations governing fishing opportunities. This is also a clear deficit, since the first two criteria of Descriptor 3 are mirrored in the CFP's conservation objective according to Art. 2.2 of the CFP and are to encourage its complete implementation. Other MSFD objectives relevant to fishing levels (Descriptors 1 and 4) exert no influence on decisions about total fishing levels. This would **require a greater meshing of the target tracking measures of the two responsible Directorates General of the EU Commission (DGs MARE and ENV) in formulating their proposals concerning fishing opportunities according to Art. 43 Para 3 of the TFEU.**

These items should be taken into consideration when individual total fishing levels are determined. In its proposal, the Commission needs to adhere to scientific recommendations, and Member States, who, according to Art. 4 of the TEU, are obligated to cooperate loyally to achieve the goals of EU law, must no longer treat the annual votes in the EU Council as a political stage, but instead act according to the narrow area of application outlined in Art 43 Para. 3 of the TFEU, treating these votes as a backdrop for policy execution.

The introduction of the definition of the ecosystem-based approach in fisheries management to the basic CFP regulation of 2014 much more clearly highlighted potential objects for regulation than was the case with the "progressive application of an ecosystem-oriented approach for stock management"[80] in the previous basic regulation (see Section 2). In contrast to the MSFD's concern that human activity be compatible with achieving and conserving good environmental status, the primary goal of CFP implementation is merely the greatest possible reduction of negative fishing impacts on the marine ecosystem. Also in contrast to the MSFD, the CFP does not aim at more comprehensive ecosystem management, instead putting traditional fisheries management in an ecosystem context. Nevertheless, the way has been paved to incremental realization of an ecosystem-based management approach.

Current developments in the successive involvement of ecosystem concerns into biological fishing stock evaluation are positive. However, the different competences for implementing the CFP (exclusively EU responsibility) and the MSFD (largely the responsibility of the Member States) impede integration into the two policy areas.[81] The implementation of a comprehensive ecosystem management system via further regulation steps within the framework of the current CFP is already stalling in the most obvious task which is also described in detail in the CFP regulation:

76 *S. auch HELCOM (2018c).*
77 *Kindt-Larsen L. et al. (2012).*
78 *Thünen Institut (o.J.).*
79 *Von Dorrien C. and Chladek J. (2018).*
80 *EC Council (2002).*
81 *Ballesteros, M. et al. (2018), p. 527.*

effectively fulfilling the landing obligation. This task has still not been completed and poses a great challenge to the Commission and the Member States.

The landing obligation in turn shows how fisheries can be regulated in an ecosystem-oriented manner: by stipulating a detailed plan, including deadlines, in the relevant basic regulation.

The next step must be the expansion of the landing obligation to other non-quota and non-target species. For the next basic regulation, another "roadmap" with quantitative fulfilment stages defined according to time and space should be considered for the restriction of bottom trawling gear use in the interest of protecting benthic biotope and habitat types. Priority should be given to implementing measures for protecting relevant biotope and habitat types in designated marine protected areas.

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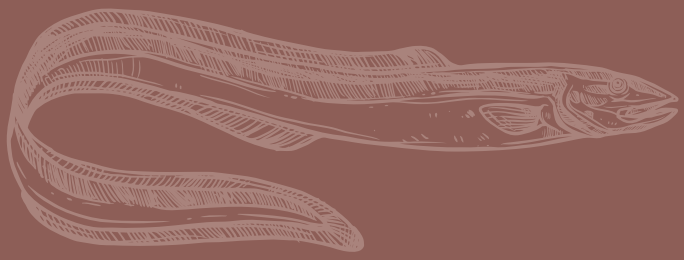

CHAPTER 5 | ECONOMIC INCENTIVES TO IMPLEMENTING THE REFORMED CFP IN GERMAN FISHERIES

Griffin Carpenter and Patricia Yagüe

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1. Introduction

The aim of this report is to analyse to which extent the Common Fisheries Policy (CFP) (and the Marine Strategy Framework Directive (MSFD)) contribute to the development of sustainable fisheries in Germany to examine to which extent government economic incentives can contribute to better implementation of CFP objectives.

Section one gives an overview about the structure and capacity of the German fleet.

Section two provides the context of German fisheries, in particular the policy context of the CFP and MSFD, features of the German fishing fleet, and whether Germany has addressed overcapacity in the fishing fleet (often characterised as too many boats chasing too few fish).

Section three reviews policy instruments that are available to manage fisheries from incentive-based to new methods such as alternative income and nudging. As incentive-based policy approaches offer a great deal of promise to supplement traditional regulatory instruments and may also overcome some of the resistance faced, this section analyses these policies in more detail. Article 17 of Regulation (EU) No 1380/2013 on the common fisheries policy stipulates the following: 'When allocating the fishing opportunities available to them, as referred to in Article 16, Member States shall use transparent and objective criteria including those of an environmental, social and economic nature. The criteria to be used may include, inter alia, the impact of fishing on the environment, the history of compliance, the contribution to the local economy and historic catch levels. Within the fishing opportunities allocated to them, Member States shall endeavour to provide incentives to fishing vessels deploying selective fishing gear or using fishing techniques with reduced environmental impact, such as reduced energy consumption or habitat damage'.[1]

So Article 17 of the CFP urges Member States to consider environmental and socio-economic criteria when allocating fishing opportunities, which are more easily addressed through incentive-based instruments.

Germany is not alone in addressing these issues. Other countries have implemented different and successful instruments to tackle overfishing and marine protection and there are lessons to be learned for German fisheries policy. **Section four** documents examples of best practice from Denmark, Ireland, the UK and France within the CFP and the Faroe Islands and Norway outside the CFP.

Section five concludes with some prioritized actions for sustainable fisheries in Germany.

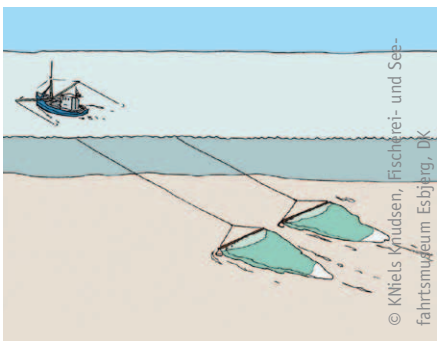
2. Policy and technical context of German fisheries

2.1 Overview of the German fishing fleet

While the quantity of fish taken from the ecosystem has received most of the attention under the CFP, the method of fishing also has an important bearing on the ecosystem. A significant portion of the German fleet uses fishing techniques, particularly bottom trawling (both beam trawl and demersal trawl), with a high impact on the marine environment.[2]

Table 1 summarises the German fishing fleet by fleet segment (a combination of length of vessel and fishing gear) across several economic and environmental performance measures.

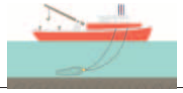
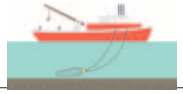
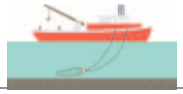
Shearing boards in bottom trawling



Beam trawling

1 *European Union (2013).*

2 *Marine Conservation Society (2013).*

Fleet segments	Number of vessels	FTE* employment	Weight of landings (t)	Value of landings (E)	Gross profits (E)	Gross profit margin	Fuel intensity (litre/tonne)
Beam trawl 10–12 m 	12	8	190	610.000	-105.000	-15,7%	1.008
Beam trawl 12–18 m 	110	137	7.648	21.390.000	5.620.000	24,0%	670
Beam trawl 18–24 m 	62	112	6.967	18.260.000	3.564.000	17,9%	854
Beam trawl 24–40 m 	9	41	3.423	11.435.000	3.224.000	28,1%	1.363
Demersel trawl 10–12 m 	11	6	907	657.000	-168.000	-16,8%	104
Demersel trawl 12–18 m 	28	21	3.797	2.813.000	392.000	13,7%	87
Demersel trawl 18–24 m 	15	43	5.893	8.939.000	2.153.000	23,4%	454
Demersel trawl 24–40 m 	10	47	9.977	18.264.000	4.980.000	24,9%	629
Demersel trawl 40 m + 	6	147	21.045	42.158.000	11.543.000	26,4%	573
Drift/Fixed net 12-18 m 	6	7	459	904.000	-429.000	-48,7%	292
Drift/Fixed net 24-40 m 	6	63	1.258	5.121.000	289.000	5,4%	1.248
Passive Gear 0–10 m 	723	527	4.846	5.928.000	1.110.000	18,2%	131
Passives Fanggerät 10–12 m 	64	43	2.857	2.345.000	-81.000	-3,3%	87
Pelagic trawl 40 m + 	12	no data	169.224	76.983.000	no data	no data	no data
Total	1.074	1.202	238.491	215.807.000	32.092.000		

**'FTE' is the full-time equivalent of direct employment in each fleet segment*

Tab. 1: Fleet statistics and accompanying economic and environmental performance for Germany. Source: STECF – The 2017 annual economic report on the EU fishing fleet (2015 data).

2.2 Analysis of German fisheries capacity

Capacity, the ability of a fishing fleet to catch fish, should be in harmony with the available marine resources. Overcapacity, often characterized as `too many boats chasing too few fish' is a common problem that has plagued fisheries globally and was identified in the reform of the Common Fisheries Policy as one of the key inhibitors of achieving sustainable fisheries in the EU.

Trawler

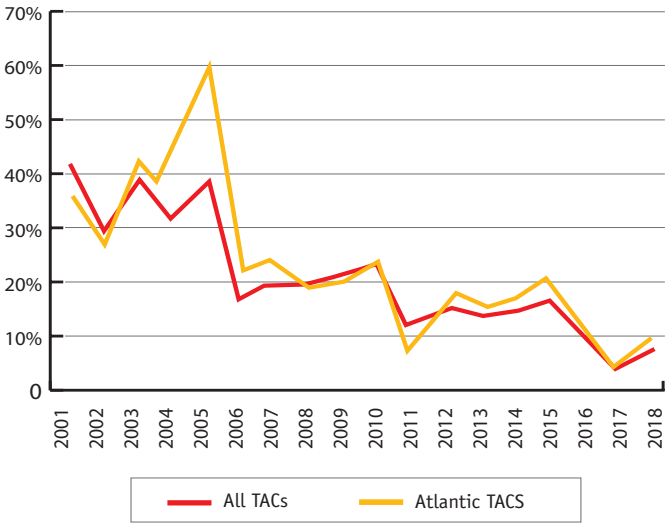


Fig. 1: Excess TAC 2001–2018, percentage of excess TAC set during the North Sea and Northeast Atlantic negotiations rose in 2018, also pushing up the excess TACs for all regions combined. Source: Carpenter (2018).

Environmental implications of the German fleet structure

Overcapacity is not necessarily an environmental problem in and of itself. Good fisheries management, in particular the setting and enforcement of appropriate fishing opportunities, limits the potential environmental impact of overcapacity. In a basic sense, it does not matter wether 10 vessels or 100 vessels are chasing the available fish as long as the catch limits are set appropriately to protect the fish stocks. In this simple scenario overcapacity is more of an economic problem – an issue of 'capacity utilisation' – than an environmental issue as the fishery is being resourced with more capital than is required. The capital invested into excess fishing vessels (and the resources required to operate those vessels) could be better spent elsewhere in society. This is an inefficient allocation of resources from an economic perspective.

Despite overcapacity being an economic problem in its basic nature, there are some associated environmental implications. One environmental issue arises because not all European fish stocks are managed through strict catching opportunities. If there is overcapacity, this may shift resources towards fisheries without catch limits and can create a repeating cycle of management measures attempting to keep up with new fisheries as they develop and become overexploited.

Another issue is that catch limits are not always set appropriately, in fact scientific advice on catch limits to reach maximum sustainable yield are frequently exceeded. **From 2001-2018 catch limits in the EU were set 19% above scientific advice – a figure that is slowly declining.**[3]

Germany ranks fifth in the 'Overfishing league table' of countries setting fishing quota above scientific advice, agreeing to TACs 22% above scientific advice on average between 2001-2018.[4]

Compounding this issue is the simple fact that catch limits are not always enforced. There are a number of potential points in the landing and sale of fish where unreported catches can occur, chief among these the fact that fish caught above quota can be discarded at sea. Although a discard ban (the 'landing obligation') has now been phased in, without complete monitoring and enforcement at sea it is not known to what extent this practice continues. Overcapacity could increase this issue by having more nets and therefore more potential bycatch at sea and certainly makes enforcement more difficult.

Overcapacity also has an environmental impact as some more vessel activity than is required increases impacts on the marine environment and increases fuel use and the associated climate impacts over and above what is required.

3 *Carpenter, G. (2018).*
4 *Ibid.*

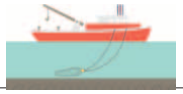
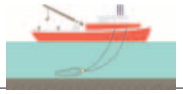
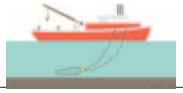
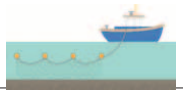
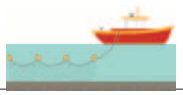
Overcapacity in the German fishing fleet

Overcapacity in EU fishing fleets is measured annually by a Scientific, Technical and Economic Committee for Fisheries (STECF) expert working group (EWG). In their report, the EWG uses multiple indicators to determine where the fishing fleets of EU Member States are out of balance with the available resources. Table 2 illustrates the most recent EWG findings on vessel capacity, biological sustainability and economic returns, which cover the period of 2009-2015. There are two indicators of vessel capacity (the `vessel utilisation ratio' measures the average days at sea as a share of the maximum days at sea as defined for each fleet segment, and the `vessel utilisation ratio > 220 days at sea' which applies 220 days as the maximum days at sea). There are two biological indicators (stocks at risk, which is the number of stocks that are targeted by the fleet segment that are biologically vulnerable as defined by either the Blim reference point or scientific advice to stop fishing, and the sustainable harvest indicator, which is the value of landings from stocks where fishing mortality is above that which would produce MSY) that measure how many stocks are being fished by a fleet segment that are biologically vulnerable and whether fleet segments are dependent on fish stocks that are being overharvested (fishing mortality is higher than the rate that would deliver maximum sustainable yield). There are three economic indicators (current revenue/break even revenue, net profit margin, and return on fixed tangible assets) that measure the economic returns from fishing.

The results indicate that for the most recent year of data (2015), many German fleet segments show signs of being out of capacity with the available marine resources. This is particularly true based on the environmental indicators as many fleet segments are targeting Western Baltic cod as one of their key species – a species that is currently and in recent years being overharvested. Many of these worrying results have held in place since the data series begins (2009), although three indicators (sustainable harvest indicator, net profit margin, return on fixed tangible assets) are showing signs of improvement for several fleet segments – just as they are for many EU Member States.

Germany has stayed well within the limits of the entry/exit regime designed to prevent capacity increases in EU fishing fleets.[5] These results indicate that to address overcapacity this scheme would need to be significantly tightened or new policy approaches pursued.

5 *European Commission (2018).*

Fleet segments	Vessel utilisation ratio	Vessel utilisation ratio > 220 days at sea	Stocks at risk	Sustainable harvest indicator	Current revenue/break even revenue	Net profit margin	Return on fixed tangible assets
Beam trawl 10–12 m 	in balance	**out of balance**	no data	no data	**out of balance**	**out of balance**	**out of balance**
Beam trawl 12–18 m 	in balance	**out of balance**	in balance	no data	in balance	in balance	in balance
Beam trawl 18–24 m 	in balance	in balance	in balance	no data	in balance	in balance	in balance
Beam trawlr 24–40 m 	in balance	in balance	**out of balance**	**out of balance**	in balance	in balance	in balance
Demersel trawl 10–12 m 	in balance	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**
Demersel trawl 12–18 m 	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**
Demersel trawl 18–24 m 	in balance	in balance	**out of balance**	**out of balance**	in balance	in balance	in balance
Demersel trawl 24–40 m 	in balance	in balance	**out of balance**	**out of balance**	in balance	in balance	in balance
Demersel trawl 40 m + 	in balance	in balance	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**
Drift/Fixed net 12-18 m 	in balance	**out of balance**	in balance	**out of balance**	**out of balance**	**out of balance**	**out of balance**
Drift/Fixed net 24-40 m 	in balance	in balance	in balance	no data	**out of balance**	**out of balance**	**out of balance**
Passive Gear 0–10 m 	**out of balance**	**out of balance**	**out of balance**	no data	in balance	**out of balance**	**out of balance**
Passive Gear 10–12 m 	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**	**out of balance**
Pelagic trawl 40 m + 	no data	no data	**out of balance**	**out of balance**	no data	no data	no data

Tab. 2: Indicators of German fleet segments as in or out of balance with fisheries resources. Source: STECF – Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-17-18). Data covers 2009-2015.

3. Policy instruments to improve the sustainability of German fisheries

The tremendous societal benefits from growing and sustaining fish stocks, combined with the urgency of the CFP and MSFD deadlines to meet conservation targets demand a consideration of any and all policy instruments available.

Beyond the direct management of fishing activity, other approaches to enhance the sustainability of German fisheries include improvement of data collection to better assess the state of the biological resources and the fishing fleet, investment in control and enforcement of fishing regulations, the proliferation and enlargement of marine protected areas (e.g. Natura 2000 sites) and investment in research and innovation to better understand the links between marine ecosystems and human activities. The main targets are to keep marine stocks at sustainable levels and protect the marine environment for future generations.

Regarding the policy instruments with a direct impact on fishing activity, there are regulatory standards and incentive-based instruments. While regulatory standards (sometimes referred to as `command and control instruments') manage fisheries through mandatory obligations or restrictions on the behavior of firms and individuals[6], incentive-based instruments (sometimes 'market-based instruments') create stimulus for individuals or firms to voluntarily change their behavior.[7] **Because change is voluntary, incentive-based instruments can potentially be ignored, whereas regulatory standards are mandatory. In this section, the latter ones are not relevant in this section.**

3.1 An incentive-based policy approach to fisheries management

How incentives lead to improved outcomes

German fisheries managers, principally the Federal Ministry of Food and Agriculture (BMEL) and the Common Fisheries Policy (CFP), must deal with heterogeneous and dynamic agents (fishers) that differ greatly in performance. In such environment, incentive-based instruments encourage positive change in fishers and work as policy levers by `moving' agents from one side of the spectrum (bad/unsustainable behavior) to the other (good/sustainable behavior). Incentives, as opposed to regulatory instruments, provide decision-making flexibility allowing fishers to modify their performance within their means. Therefore, incentive-based instruments are most effective when dealing with heterogeneous and dynamic agents that need flexibility to adapt to changing policy systems.

Incentive-based instruments work because they affect fishers' profit function either by increasing their profits (`rewards') or reducing them (`penalties'). For instance, allowances such as quota and space allocation, effort allowances, and direct financial contributions to fleets that implement ecosystem-friendly fishing methods incentivise other fishers to follow through. Fishers who are not rewarded because their fishing methods are not sustainable are at a disadvantage but have the opportunity to change fishing methods to gain the same rewards as their peers.

Low environmental effects by jigging reels

The German government can utilise incentive-based instruments as levers to trigger change in fleets that implement non-sustainable fishing methods. For instance, it can penalise non-sustainable fleets by closing fishing grounds to non-selective fishing methods such as trawlers, or increase effort to low-impact fishers i.e. by increasing their time at sea. Following the metaphor of `carrots and sticks' as a combination of rewards (carrots) and punishment (sticks), Figure 1 depicts the positive and negative policy levers that can incentivise sustainable fisheries and are described in more detail later in this section.

6 *Perman, R., Ma, Y., McGilvray, J., & Common, M. (2003), p. 217.*
7 *Ibid.*

Fig. 2: Policy levers to incentivise sustainable fisheries through allowances (carrots) and penalties (sticks)

The context provided by Article 17 and 7d of the CFP

Article 17 of the reformed CFP urges Member States to allocate fishing opportunities using objective and transparent criteria that account for environmental, social and economic factors. Two elements to consider include the impact of fishing on the environment and the contribution of fishing opportunities to the local economy.

When allocating the fishing opportunities available to them, as referred to in Article 16, Member States shall use transparent and objective criteria including those of an environmental, social and economic nature. The criteria to be used may include, inter alia, the impact of fishing on the environment, the history of compliance, the contribution to the local economy and historic catch levels. Within the fishing opportunities allocated to them, Member States shall endeavour to provide incentives to fishing vessels deploying selective fishing gear or using fishing techniques with reduced environmental impact, such as reduced energy consumption or habitat damage.[8]

In a similar vein, Article 7 points to the use of fishing opportunities incentives for conservation purposes.

Measures for the conservation and sustainable exploitation of marine biological resources may include, inter alia, the following:

(d) incentives, including those of an economic nature, such as fishing opportunities, to promote fishing methods that contribute to more selective fishing, to the avoidance and reduction, as far as possible, of unwanted catches, and to fishing with low impact on the marine ecosystem and fishery resources.[9]

Incentives and government aid must be provided to fleets that deploy selective fishing gear or fishing techniques that contribute to the protection of the marine environment and the recovery of fishing stocks. Techniques implemented include reducing fuel consumption or preventing marine habitat damage. Implementing these goals calls for a restructuration of current policy instruments to trigger change and reward fleets' participation in ecosystem-friendly policy measures.

What behavior to incentivise

Trawlers contribute to the vulnerability of the marine ecosystem by using non-selective fishing methods and impacting on the sea floor when dragging the nets. Although small-scale fleets make up the majority of the German fleet by units[10], their ecological impact is small compared to trawlers and other forms of industrialised fishing. Small-scale fleets often use very selective gear with reduced environmental impact[11] and lower fuel use. But it highly depends on how "selectivity" is defined. E.g. relatively small gillnet vessels may have low negative impact on the seafloor but high negative impact on biodiversity due to bycatch of seabirds and marine mammals like harbor porpoises. Many of these ecological problems are currently occurring in German Baltic Sea coastal fisheries.

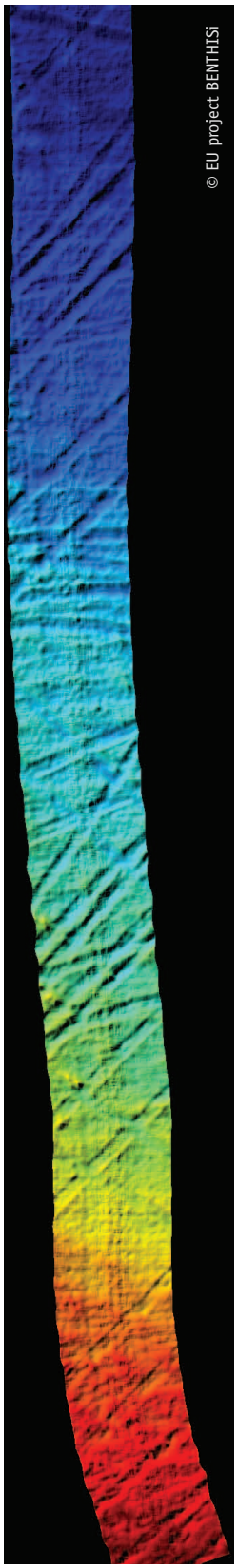
8 *European Union (2013).*

9 *Ibid.*

10 *Centenera, R. (2014).*

11 *Marine Conservation Society (2013).*

The Marine Conservation Society published a list of fishing methods and rated them according to various criteria including impact on habitat and non-target species.[12] Of the 32 gears analysed by the Marine Conservation Society, beam trawlers were rated as `high impact' for impact on habitat and non-target species in a scale from very low impact to high impact. Although the beam trawl fleet provides higher profits and jobs than small-scale fleets[13,14] their cost to society and the environment is not accounted for when profits are calculated.



Sonar shot of beam trawl tracks on the sea bed, North Sea

Comparison of sea bed: Undisturbed and after beam trawling

In this context market forces alone will not deliver an optimal outcome in terms of the distribution of effort between fishing types. Compounding this issue, the German government has neglected the needs of coastal communities and small-fleets in lieu of industrialised fishing fleets (mostly trawlers) probably due to the "lack of provisions in the German system of fishing opportunities that explicitly target the small-scale fleet".

Fuel subsidies provide perverse incentives to fuel-intensive fleets such as deep-sea and beam trawlers whose profits increase as a direct result. Table 1 illustrates a difference in fuel intensity of over 10 x between passive gear vessels (and small demersal trawlers) and most beam trawl fleets. The full costs to fishing are underestimated because fuel costs are lowered due to subsidies. Profits appear higher than they would otherwise be without the subsidy. This 'pull effect' can increase capacity by attracting more fishers into the industry where licences are available, slowing the exit of fishers that would otherwise be unprofitable, or increasing the length of the fishing season. The distorting effects of fuel subsidies are greatest in deep-sea and beam trawl fisheries as they are the most fuel intensive, and the risks to stock health are greatest in fisheries with a lack of control, particularly fishing quota as an output control.[15]

12 *Ibid.*

13 *European Commission (2016).*

14 *Carvalho, N., Keatinge, M. & Guillen, J. (2017).*

15 *Carpenter, G. & Kleinjans, R. (2017), p. 148*

Support for low-impact fishing methods can secure the survival of the industry as well as the food supply. Coastal communities are keener to protect their livelihood than trawlers or industrialised big fleets, which tend to lack interest in protecting the grounds where they fish. They are not socially and culturally tied to specific regions like small-fleets and coastal communities are in the event of diminishing stocks, they can easily move to other regions. Nevertheless, it needs to be safeguarded that small scale fleets are using low impact gear. E.g. gillnet are not fulfilling this criteria due to high bycatch rates of marine mammals and seabirds.

Victim of gillnet fishery: Old-squaw (Clangula hyemalis)

Licensing and effort

To allow fish stocks to regenerate and comply with MSFD's mandate of protecting marine biodiversity by 2020 it is vital to reduce fishing effort. To this end, German regulators can reward fishing fleets that invest in ecosystem-friendly gear and technology that reduces the impact of fishing in the environment and avoids bycatch by way of licences and quota distribution. Giving priority to fleets that contribute to the application of a sustainable fishing system can incentivise the industry to adhere to it more rapidly. In 2017, the German fleet consisted of 1,373 vessels including 1,069 gillnet cutters (>12m) and 76 trawlers.[16] Although gillnet cutters (the core of the German fleet by units) are more selective than trawlers they also impact the marine environment entangling and bycatch non-targeted species like porpoises, other marine mammals and seabirds.[17,18] There are ways to reduce their impact, for instance using alternative gears like e.g. traps, pound nets which effectively avoid bycatch of marine mammals and seabirds. The German government needs to reward fishers that invest in reducing their ecological impact with these and other improvements. **Ways in which the German government can apply licensing and effort regulation to comply with Article 17 of the CFP include:**

- **Set aside fishing licences for small-scale fleets and fleets that invest in fishing methods that reduce environmental impact giving them priority throughout the season.**
- **Provide licences to conflicting areas with low stocks to small fleets and those that use more selective gear**

Seasonal and zonal closures

Given the high number of vulnerable species in the Baltic Sea (including the European eel and the Western Baltic cod)[19] where the greater number of German vessels fish, seasonal and zonal closures can be implemented to aid in the recovery of fishing stocks. This type of regulatory measure was successfully implemented in Carry-le-Rouet, in the Mediterranean Sea[20] and fisheries closure for the western Baltic cod spawning season from in February and March 2016 to 2018.[21]

Subsidies

If used correctly, governmental aid can provide support to transition from a non-sustainable to a sustainable fishery system. For instance, by supporting research and innovation, control and enforcement of marine protection, enlargement of Natura 2000 sites and data collection to better understand MSY and linkages between human activities and marine habitat loss. However, heavy subsidies to the fishing industry are the root of overcapacity in European waters[22] leading in 2004 to an EU ban to governmental aid to improve fishing fleets.

For this reason, caution must be taken with subsidies to purchase new engines and new fishing vessels that could increase capacity, as currently discussed in response to the revision of Section 5.6 `Operating aid in outermost regions´ of the State Aid Guidelines to the fisheries sector. In Germany, fuel subsidies increase fishing profits artificially attracting more fishers into the economy and increasing capacity as a result. Removing the fuel subsidy in Germany would act as an incentive given that fishing is a fuel-intensive industry and there is significant variance in fuel intensity by fleet type (see table 1). Fuel subsidies are extremely costly for governments too, increasing the social cost of fuel and decreasing the efficiency of the instrument. Also, by lowering the price of fuel, fuel usage increases driving pollution up.[23]

16 *Marine Conservation Society (2013).*
17 *Bellebaum J. (2011).*
18 *ICES (2011).*
19 *HELCOM (2013).*
20 *Harmelin, J.-G., Bachet, F. & Garcia (1995).*
21 *ICES Advise (2018).*
22 *European Commission (2009). .*
23 *Carpenter, G. & Millar, C. (2018).*

However, the European Marine Fisheries Fund (EMFF) can provide funding to transition to a more sustainable German fishing industry. In 2015, the European Commission has adopted investment packages for the maritime, fisheries and aquaculture sectors of Denmark, Estonia, Germany and Sweden for the period 2014-2020. The German EMFF budged is 284.598.180 € including 219.596.276 € of EU funds.[24] Around 65 m € is the German share. The operational programs (OP), which is fully in line with the EMFF priorities and the EU's common fisheries policy (CFP), promote resource-efficient, innovative, competitive and knowledge-based fisheries and aquaculture.

Investment will support projects that promote sustainable aquaculture and fisheries (for example reduction of unwanted catches) and projects that improve the competitiveness of those sectors (innovation, processing and marketing). Besides, a significant part of the budget can also be used to support the implementation of the CFP through the collection of fish stock and other marine data as well as various measures to control fishing activities.

In addition to the four provisions highlighted by the EMFF to secure funding for the protection of the marine environment (fisheries, control and enforcement, data collection and blue economy), Germany's EMFF Operational Programme[25] acknowledged some of the issues that could be addressed, namely:

1. **Reduce environmental impact of fisheries**
2. **Protect and restore aquatic biodiversity**
3. **Secure balance between catch capacity and available resources**
4. **Make fisheries competitive including small-scale coastal fisheries (SSCF)**
5. **Support technology and innovation, increasing fuel efficiency**
6. **Development of vocational training and lifelong learning**

Unfortunately, the first both issues have not been addressed by the German OP published four years ago. In view of the MSFD's approaching deadline to protect the marine environment and achieve GES by 2020, Germany needs to address these issues with urgency. For instance, to address point 2, European funding (EMFF) could be invested to enlarge spawning zones for endangered species such as tope shark[26] to compensate for stock declines. Germany has four Natura 2000 sites in the North Sea and six in the Baltic Sea (Tab. 3). Regarding point 1, EMFF funding could be used for more selective and bycatch avoiding gear.

24 *European Commission (2015).*

25 *BMEL (2014), p. 47.*

26 *For a complete list of threatened fish species in Germany see http://fishbase.org (Froese, R. and Pauly, D. (eds) (2008).*

Sea basin	Name	Size	Status	Selection criteria
North sea	Sylt Outer Reef	5.321 km²	SAC	Harbour porpoises, sandbanks, reefs
	Eastern German Bight	3.140 km²	SPA	Diver species, resting birds
	Borkum Reef Ground	625 km²	SAC	Sandbanks, reefs
	Dogger Bank	1.692 km²	SAC	Sandbanks
Baltic sea	Fehmarn Belt	280 km²	SAC	Harbour porpoises, sandbanks, reefs
	Kadet Trench	100 km²	SAC	Reefs
	Western Rønne Bank	87 km²	SAC	Reefs
	Adler Ground	234 km²	SAC	Sandbanks, reefs
	Pomeranian Bay with Odra Bank	1.100 km²	SAC	Harbour porpoises, sandbanks
	Pomeranian Bay	2.005 km²	SPA	Diver species, resting birds

Tab. 3: German marine NATURA 2000 sites. Notes: SAC: Special Area of Conservation/SPA: Special Protected Area for Birds

As part of the EMFF's data collection objective[27], Germany could invest in scientific research to improve the data availability regarding fishing activities and bycatch rates of endangered species (e.g. harbor porpoise, seabirds) and provide training to fishermen to help researchers to collect relevant data. Insufficient investment in scientific marine assessments of fishing activities and bycatch rates jeopardises the ability of Member States to address fish stocks depletion and some species could be already at risk of collapse without our knowledge.[28,29]

Taxes, levies and fines

Taxes provide revenue for the government that can be used to fund other environmental programs including the protection of the marine environment. Fuel taxes can incentivise the industry to invest in fuel-efficient fleets helping the German government to address point 5 of its Operational Programme (Support technology and innovation, increasing fuel efficiency). However, it is important to note that taxes are unpopular among the industry and difficult to implement due to heavy opposition even if they can be really effective and efficient. Additionally, to set the right tax regulators need to gather extensive information about the industry as well as costs and benefits, which is not easy specially when dealing with heterogeneous agents.

Challenges to an incentive-based policy approach

Incentive-based policy approaches are not without their own challenges. Incentives designed to reward particular fishing methods are prone to lobbying interests shifting these programmes towards their fishing methods and their benefit. However, there is no allocation of resources, whether that is the status quo based on historical share or market forces (with a litany of externalities), that is neutral with respect to fishing methods. Another issue is that some minimum standard is required for fisheries participation and incentives should not apply in each and every instance. As electronic monitoring of fishing vessels has come into policy focus in the EU there have been calls to incentive their use by rewarding quota and/or effort but also calls to require the use of electronic monitoring as a minimum standard for all vessels to comply with.

27 *European Union (2015).*
28 *Nieto, A. et al. (2015). ; HELCOM (2013).*
29 *European Union (2014), EU 508/2014.*

3.2 New approaches

In addition to regulatory and incentive-based instruments, the German government could implement new approaches to address overfishing and comply with the CFP's mandate.

Alternative income

Nautical tourism, or offering tourists the possibility to go out at sea with fishermen and learn about the ocean and the history of the region is another way to reduce capacity without jeopardizing the livelihood of small-scale fishers. Fishermen are paid for their services what they would get from landing stocks, providing alternative income when TACs limit fishing opportunities. Nautical Tourism is being tested with success in other maritime areas like Murcia and Galicia in Spain.[30] In Germany, coastal and marine tourism in the North Sea is the number one sector by number of jobs, and second by revenue (whilst fisheries is sixth by jobs and revenue) and the number one sector by jobs and revenue for the Baltic Sea.[31] Investment in nautical tourism offers a promising policy option to reduce fishing capacity without forcing fishers out of the job market. Scientific research is another potential source of alternative income and there is already BONUS initiative in the Baltic Sea is training and hiring fishing ships to conduct scientific research.[32]

Real-time incentivese

Real-time incentives are a proposed system of credits or `currencies' given to fishers that allow them to fish wherever and whenever they want in exchange of `tariffs' that reduce the number of credits depending on the sites they decide to fish. Managers decide the tariffs based on scientific assessments of marine stocks and prices indirectly incentivise fishers to fish where is `cheaper' or in less sensitive areas and therefore where tariffs are lower. Some research has indicated that the use of real-time incentives outperforms the traditional management systems of quota and effort allowances.[33] But their "success" depends heavily from who assesses the whole marine area to define the "price" for fishing.

Nudging

D`Nudging', which changes behavior "without forbidding any options or significantly changing [people's] economic incentives"[34] is a fairly new approach to policy and resource management that triggers positive reinforcement by altering choice architecture. The main characteristics of a nudging approach is the preservation of freedom of choice. Individuals are given an array of choices but are prompted to opt for the 'desired' choice not by coercion (as in regulatory processes) but by intrinsic motivations. An example could be an opting in to different licences to fish during sensitive spawning seasons, thus focusing attention on the decision being made and its consequences.

To date nudging has not been widely applied to commercial fisheries. While the term has been used by some researchers to refer to some of the allowances and penalties detailed here, these instruments explicitly alter the economic incentives of participants so it is unclear whether they can be considered `nudges'. Still, as fishers often have strongly held intrinsic motivations more research in this space could yield successful new policies.[35]

30 *Turismo Marinero Murcia (2018).*
31 *European Commission (2014).*
32 *BONUS (2012).*
33 *Kraak, S.B. et al. (2015).*
34 *Thaler, R. & Sunstein, C. (2008).*
35 *Mackay, M., Jennings, S., Putten, v.l., Sibly, H. & Yamazaki, S. (2018).*

4. Examples of best practice to support or carry out incentive-based policy approaches

The following section documents examples of best practice in Europe – both inside about outside the EU – of policies to support or carry out incentive-based policy approaches. Ireland's quota allocations, the UK's Mackerel Box, Scotland's Conservation Credit Scheme, Denmark's coastal fleet, and Norway's landings incentive are all examples of incentive-based instruments in action. Denmark's FishFund, France's quota reserve, and the Faroes' quota auction are all examples of policies that allow the government to pursue environmental objectives in its allocations. This has been particularly challenging **in Germany where the continued allocation of quota allowances in the same shares to the same fishing licences has allowed fishing quota to become 'accidentally privatized' as fisheries come to view fishing opportunities from the state as their own private property.** This view in Germany has made quota reallocation for environmental objectives a challenging proposal[36] but these examples illustrate that this situation is not inevitable and reform is possible – particularly with the use of a notice period to allow investments to be recouped.

The most simple means of allocating opportunities according to environmental criteria is to have an underpinning arrangement, whereby a quantity of quota is set aside for vessels meeting the environmental criteria.[37] This was done in the UK for a small number of UK fisheries, and it should be investigated whether there are other fisheries in which a more environmentally friendly segment could be encouraged by setting aside an allocation of quota.[38] This type of arrangement would support the lower impact operations that are already in place. To go further and encourage vessels to switch to a lower impact fishery, it would be possible to reallocate quota from a segment with a greater impact.[39]

The use of ecosystem-friendly fishing gear like fish traps as an alternative to bycatch-intensive fishing methods has brought positive results in pilot projects funded by the Federal Agency of Nature Conservation in Germany. Fish traps in German Baltic Sea waters (Mecklenburg-Western Pomerania) have greater selectivity and less bycatch of seabirds and porpoise but lower fishing efficiency than gill nets. But the alive-caught fish has a higher quality and can attract a higher market price, for example with eco-certification.[40]

Fish trap reduces bycatch of sea birds and harbour porpoises

36 *Carpenter, G. & Kleinjans, R. (2017).*
37 *Newmann, S. (2014).*
38 *Ibid.*
39 *Ibid.*

40 *Federal Agency of Nature Conservation.*

Figure 3 provides a visual summary of the best practice examples in Europe. The majority of the examples are using quota allowances as positive incentives, reflecting the fact that this is a particularly important driver of the fisher behavior.

Fig. 3: Examples of best practice to support and deliver incentive-based policies for sustainable fisheries

4.1 Examples within the Common Fisheries Policy

Denmark: FishFund and coastal fleet allocations

The Danish government sets aside a portion of its annual quota in a `FishFund' that is used at the government's discretion. The largest portion of the FishFund is a quota loan to allow young fishers into the industry until the fisher is self-sufficient or for a maximum of eight years. However, to be eligible to FishFund quotas, fishers need to adhere to different criteria, including participation "in research or trial innovative technologies".[41] Through use of the FishFund the Danish government is able to provide consistent security to the industry for most of its quota while ensuring that there is also quota available to pursue its own objectives.

Additionally, the Danish government has reallocated quota (worth an estimated € 5m) to the coastal fleet segment which is not only small-scale (<17m) but also uses low-impact fishing methods regarding the impact on the seafloor (passive gear). This quota bonus is only available to fishers who enter the pool and cannot be transferred out of the pool, meaning the incentive is lasting. By attaching a low-impact gear requirement this coastal fleet allocation is different from quota pools for the small-scale fleet that exist in many other European countries.[42]

The use of a FishFund as a reserve of quota and the explicit period of validity for quota (was eight years, now sixteen) prevents the creeping entitlement or `accidental privatisation' that has tied the hands fisheries administrations in Germany and other EU Member States to either ad-hoc or permanent revisions to quota allocation.

Ireland: Quota allocations under Article 17

To protect coastal communities and artisanal fleets from the potential concentration of quota allowance by large fishing operators, the Irish government set aside quota allocations for under 18m artisanal gillnet and hook and line mackerel fishing, herring ringnets and surface longlining for albacore tune.[43] The Irish Government makes explicit reference to Article 17 of the CFP in designating its quota allocations. Stakeholder engagement with German fishers, following the model used in Ireland, would be needed in Germany point towards fisheries for which this might be an appropriate tool.

France: Quota reserve

In France, quota allowances can be transferred permanently via vessel sales or decommissioning as the track-record associated with the vessel also gets exchanged. Since 2015, when a vessel is sold, 80% of its quota stays with the vessel – going to its new owner – and 20% goes to the national (30%) and producer organisation (70%) reserves. When a vessel is taken out of the industry, its associated quota is distributed 50:50 to the national and PO reserves. This reserve allows the French directorate (and POs) to make special allocations to pursue a variety of objectives.[44]

Scotland: Conservation Credits Scheme

The Scottish Government set up the Conservation Credits Scheme (CCS) in 2008 as a method to reduce fishing pressure and the incentive to discard catches above quota. The conservation measures in the CCS include real time closures to protect reproducing fish, gear regulations to allow non-target fish to escape and trialing on-board cameras on fishing boats to record catches. Under the credits part of the system, limited time is allocated to vessels using non-selective gear (in particular trawls for whitefish and Nephrops) and additional time is awarded to vessels using more environmentally friendly fishing methods.[45,46] The CCS has generally received positive reviews, although much more success was observed in reducing cod discards than haddock and whiting.[47]

As the EU's cod recovery plan limiting fishing effort ended in 2016 so too did the Conservation Credits Scheme. However the mechanisms are available for any Member State to restrict and reward fishing effort through a similar scheme – in fact Article 17 of the CFP encourages the use of fishing opportunities in this manner.

UK: Mackerel Box

Since the outset of the Common Fisheries Policy in 1983, the EU Council of Ministers established a zone closure in the area of Cornwall, in Southwest England to protect mackerel stocks from offshore pelagic trawlers. The closure area, known as the `Mackerel Box', is limited to gillnetting and handling and quota allocations are exclusive to these fishing methods totaling 0.83% of total UK mackerel quota allocation or 1,750 tonnes, whichever is greater.[48] Mackerel stocks have improved greatly since the closure of the area to trawlers and purse seiners.[49]

41 *Carpenter, G. & Kleinjans, R. (2017).*
42 *Ibid.*
43 *Ibid.*
44 *Ibid.*
45 *Scottish Government (2011).*
46 *Marine Scotland (2015).*
47 *WWF (2009).*
48 *Newman, S. (2014), p. 12.*
49 *History of the Cornish Fishing Industry (2018).*

School of mackerels (Scomber scombrus)

In Ireland the Dunmore Box prevents vessels larger than 20m from fishing for herring in order to protect the stock in a herring spawning zone[50], although changing vessel size is even more difficult (and thus more of a command than an incentive) than changing fishing gear.

4.2 Examples outside the Common Fisheries Policy

Norway: Landing incentive

Norway has implemented various policies to protect their fish stocks and ensure the sustainability of their marine environment. Dumping non-targeted species is forbidden under Norwegian law, whether vessels hold quota for the species or not. The economic value of fish caught above quota is forfeited to the state but in the whitefish sector 20% of the value is kept by the fisher to encourage landing rather than discarding at sea. Under CFP mandates however, holding fish species on board without quota is illegal, prompting anglers to discard non-targeted species entangled in the nets. This practice is not only wasteful and unethical but it reduces dramatically fish stocks jeopardizing the fishing industry as a whole. Initially, a ban on discard could potentially discourage fishermen to invest in selective gear but the Norwegian total ban on fishing discards has proven otherwise; the biomass of cod, haddock, saithe and herring has increased at a rate of 18% per year since the ban was implemented.[51]

Faroe Islands: Commitment to fisheries as a public resource through public auction

In 2018 the Faroe Islands passed a new fisheries reform to prevent the privatisation of the seas and retain public control over fishing resources. The Faroese nationalised their fishing quotas and are distributed to the fishers in public auctions and quota holders are obliged to use them. Additionally, fishing licences cannot be traded directly between private hands but need to be auctions out in the public. Another important element of the reform is the allocation of fishing quotas to trawlers based on the number of fish they can catch and not the number of days-at-sea, as previously established.[52]

Although the allocation of fishing opportunities through auctions is not based on any specific principles, developing a list of environmental criteria, sometimes called `beauty contests' or sustainability scorecards' could strengthen the sustainability of the process.[53]

50 *Department of Agriculture, Food and the Marine of the Government of Irland(2016).*
51 *Diamond, B. & Beukers-Stewart, B. D. (2009).*
52 *Hanssen, L. (2018).*
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5. A way forward

The twin 2020 deadlines to end overfishing under the Common Fisheries Policy and to protect the marine environment under the Marine Strategy Framework Directive require EU Member States to critically assess the management of their fisheries. Germany, like other Member States, still has significant ground to cover in a short period of time. Fishing pressure remains high and overcapacity in the fleet will surface elsewhere if short-term crises in fish stocks continue to be dealt with independently.

This challenge requires the German Government to step back and assess the breadth of policy instruments that are available to reduce the impact of the fishing fleet on the marine environment. This chapter has given particular focus to incentive-based instruments that provide a stimulus to trigger positive change in accordance with Article 17 of the reformed CFP that prompts Member States to allocate fisheries opportunities based on environmental and socio-economic criteria.

Examples of incentive-based instruments from countries both within and outside the EU illustrate that this is a shared challenge, and there are ample lessons to be learnt. Principally, to implement these incentive-based instruments would require a recognition in the German Government that as fish are a public resource the opportunities to fish them are best understood as leased entitlements from the state that are subject to change. To date, taking an incentive-based approach to fishing opportunities has been neglected as fishers have come to view as private property. The longer fishing opportunities are neglected as a policy tool, the more difficult it becomes to change.

Cod (Gadus morhua)

The accidental privatization of fishing opportunities in Germany, along with the urgent deadlines in the CFP and MSFD, requires immediate action. This obligation comes with a reward. Getting fisheries management right in the form of higher landings, incomes, profits, and a more resilient ecosystem, make sustainable fisheries a challenge worth undertaking.

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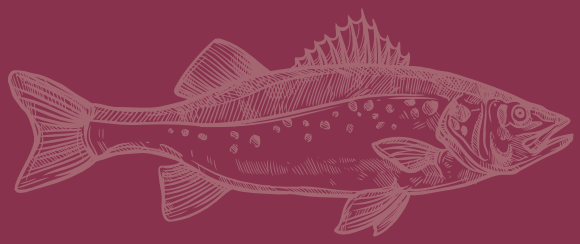

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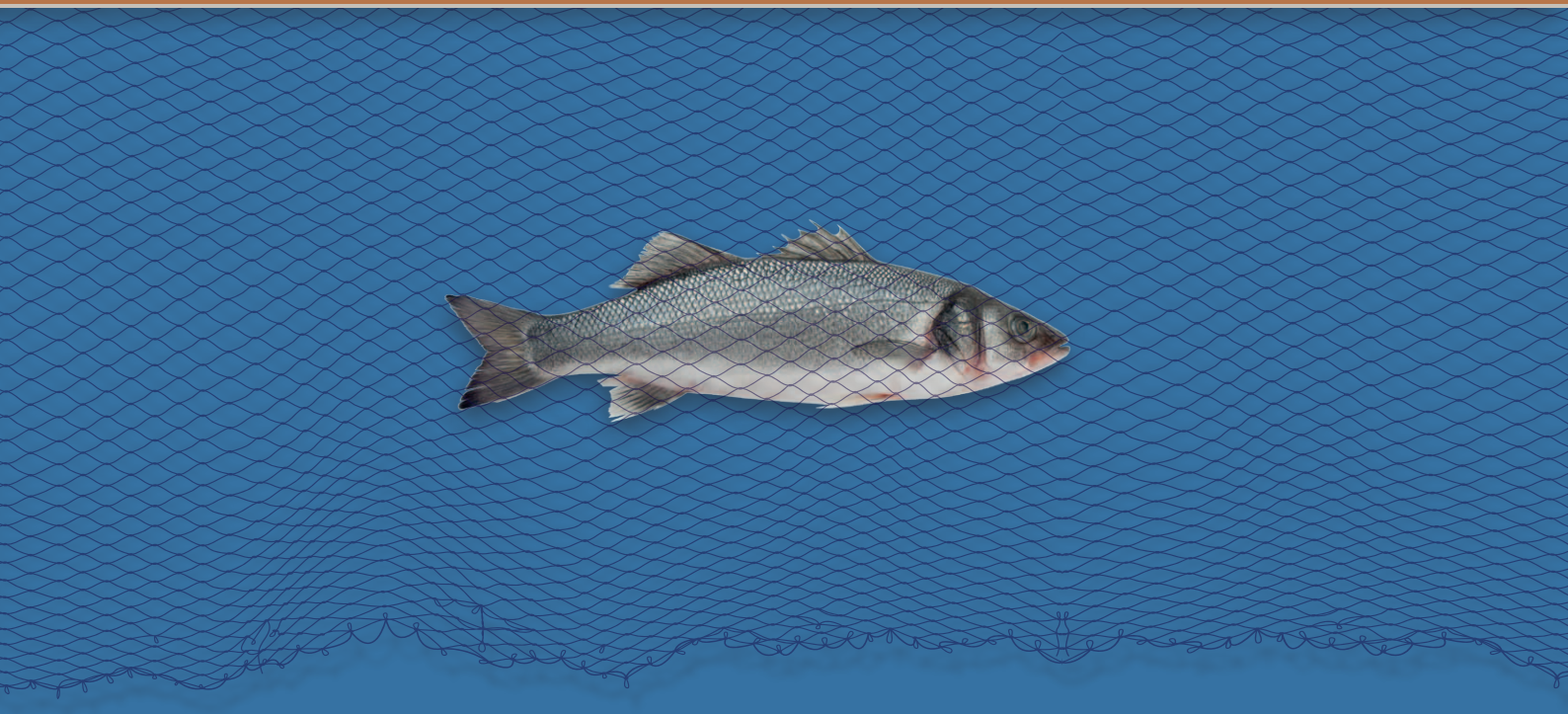

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CHAPTER 6 | FINAL ASSESSMENT

1. Has there been a reduction in the negative effects of EU fisheries on marine species and habitats?

1.1 Are there improvements in the status of managed fish stocks?

The goal of the 2013 iteration of the regular reforms to the Common Fisheries Policy (CFP) is for fish stocks to regain sizes required for "maximum sustainable yield" (MSY), or for stocks that are above that size to be conserved.

Since the 2013 CFP reform, the status of fish stocks in European waters (North East Atlantic, Mediterranean Sea, and Black Sea) have improved somewhat. For instance, the number of stocks outside safe biological limits fell between 2013 and 2017 from 19 to 17, and the stocks within such limits rose from 27 to 29 (only 46 stocks were included in the assessment) (Section 1.2.3).[1] There was also a slight increase in the biomass of the assessed stocks (see Figure 1, North Sea example).[2] There has thus been progress with respect to the status of fish stocks, but that progress has been extremely slow.

Froese et al. (2018) concluded that of 397 analysed European fish stocks in 2017, half were still outside of safe biological limits (biomass < 0.5 B_{MSY}*).[3] There were also clear regional differences. For instance, the situation for stocks in the Barents Sea and the Norwegian Sea are doing best: 50 % of stocks meet MSY criteria according to Froese et al (2018). The status of stocks in the Mediterranean Sea and the Black Sea, on the other hand, continue to be worrisome: the majority are considered to be overfished. Insufficient data make definitive statements on stock biomasses impossible for either of these seas.

A look at the North Sea and Baltic Sea shows that stocks that are very important economically still have an especially poor status.[4,5] This is true of the two cod stocks (*Gadus morhua*) in the **Baltic Sea** and the herring stock (*Clupea harengus*) in the western Baltic Sea (including the Skagerrak and the Kattegat) (*spring spawners*).[6] The cod stock in the eastern Baltic Sea is outside of safe biological limits (spawning stock biomass SSB < B_{lim}**), meaning that reproductive capacity is impaired and stock recovery endangered.[7,8]

Of the ten Baltic Sea stocks for which an estimate is possible, seven fit the SSB MSY approach (> MSY $B_{trigger}$), but only three of them completely fulfil the CFP criteria (see Art. 2.2 of the basic CFP regulation), meaning that the fishing mortality rate is less than or equal to the target value of F_{MSY}***.[9]

Stocks of cod in the Baltic Sea (Gadus morhua) still in a poor condition

In the **North Sea**, there are minor improvements in fish stock status. For instance, the number of stocks reaching the MSY biomass target rose between 2014 and 2018 from 13 to 29 (Table 1). However, no assessment can be made of 81 stocks due to insufficient data.[10]

B_{MSY}	Spawning stock biomass (SSB) that results from fishing at F_{MSY} for a long time
B_{lim}	Reference point for spawning stock biomass (SSB) that must in no case be undercut so that a stock's reproductive capacity is not compromised
$B_{trigger}$	Spawning stock biomass triggering a specific management reaction. In the context of MSY, this is the lower limit of the ranges around B_{MSY}
F_{MSY}	Reference point for fishing mortality (F) consistent with achieving MSY

1 *Scientific, Technical and Economic Committee for Fisheries (STECF) (2019).*
2 *Ibid*
3 *Froese, R. et al. (2018).*
4 *ICES (2018a).*
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6 *ICES (2018a).*
7 *ICES (2018c).*
8 *Froese, R. et al. (2018).*
9 *ICES (2018a).*
10 *ICES (2018b).*

North Sea	2014	2015	2016	2017	2018
Number of stocks achieving biomass target[1]	13	25	26	16	29
Number of stocks missing biomass target[2]	2	12	11	9	9
Status unknown	95	83	81	93	81

[1] = Stock biomass (SSB) > MSY $B_{trigger}$
[2] = Stock biomass (SSB) < MSY $B_{trigger}$
Data source: (ICES 2018b).

Tab. 1: Number of stocks in the North Sea achieving or missing the MSY biomass goal.

Moreover, among the stocks that have developed positively, there are some that are too heavily exploited. Only 18 stocks have so far completely fulfilled the CFP criteria cited above (see also Section 1.5).

Overall, there are minor improvements in the status of commercially exploited fish stocks in European waters, including the North Sea and the Baltic Sea. The status of individual stocks that are of particularly great economic importance is especially problematic.

1.2 Will the target MSY be reached by 2020? Is it even possible to achieve the targets for all stocks?

In addition to the biomass goal, the CFP stipulates that by 2015 or 2020 at the latest, the degree of stock management will be adapted to the MSY goal. The fishing mortality rate is thus not to exceed F_{MSY}. In order to achieve the biomass target, however, the threshold must be lower, so that a fishing mortality of 0.9 F_{MSY}, for example, may not be exceeded.[11,12]

In the 2015 target year, the MSY target was clearly missed.[13] Minor progress can be seen in the determination of catch limits ("quotas"), so that the number of stocks whose total allowable catch limits (TACs) are above the MSY target (F_{MSY}) is falling steadily (see Figure 1 and Section 1.2.3).

A fundamental condition of stock improvement is to follow scientific recommendations when setting TACs. This condition is still not being met.[14] For instance, TACs in 2019 deviated from the scientific recommendations in about 40 % of cases.[15,16]

For North Sea stocks, the average fishing mortality rate for various commercially exploited stocks has fallen in the past few years and is now less than or equal to the F_{MSY} reference value for more than half of stocks for which a determination can be made. For the majority of stocks, however, there was no reference value (Fig. 1).

Baltic Sea management, too, fails to meet the CFP targets. In 2018, the fishing mortality rate for half of the assessed stocks was above this value (< F_{MSY}) (Fig. 1).

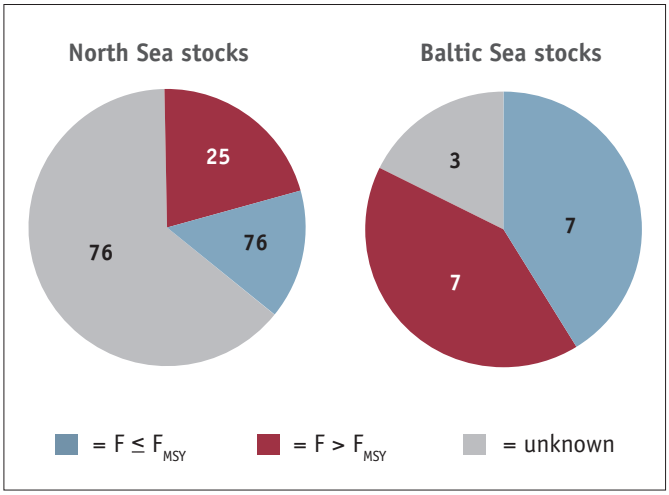

Fig. 1: Fisheries pressure on the North Sea and Baltic Sea stocks in 2018: Number of stocks for which the fishing mortality rate (F) is less than or equal to the reference value (F_{MSY}) = green, F > F_{MSY} = red. Grey is the number of stocks for which no reference value could be determined. Source: ICES (2018a), ICES (2018b).

The extent to which biomass (SSB) of the stocks whose status is not good can grow to a size that meets the MSY approach (> B_{MSY}) is uncertain, as is the time it will take for that to happen. For one thing, for most stocks data on biomass sizes are not available to allow such an estimate to be made. For another, there are other factors besides fisheries pressure, including availability of food, that play an important role. [17]

11 German Advisory Council on the Environment (Sachverständigenrat für Umweltfragen – SRU) (2011).
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17 See the example of the Baltic Sea cod: Zimmermann, C. & Krumme, U. (2015).

There is noticeable progress in setting sustainable catch limits, but it is being made too slowly for the 2020 CFP targets to be reached. For this reason, it is urgently necessary that a decisive change of course be made in catch limits setting so that all of them, without exception, comply with the CFP and MSFD targets.

1.3 Has fisheries selectivity improved?

The introduction of a landing obligation for important commercial fish species is among the significant innovations initiated with the last CFP reform. Its implementation was incremental via discard plans that the Commission ratified in the form of delegated regulations.[18] Since 2015 and 2016, respectively, a landing obligation has been in force for the North Sea and the Baltic Sea. The progress that has so far been made has not been finally assessed. Nevertheless, the Scientific, Technical and Economic Committee for Fisheries (STECF) report for 2018 reached the conclusion that fisheries practices in the Baltic Sea in particular had not adapted sufficiently to the landing obligation, especially with respect to the use of selective fishing techniques.[19] The data for cod stocks in the two domestic seas indicate that violations are still widespread.[20,21]

The noticeable progress towards greater selectivity with respect to bycatch of endangered species (especially marine mammals and sea birds) is even slighter (see Section 1.5). The risk of harbour porpoise (*Phocoena phocoena*) and diving sea birds drowning in gillnets and entangling nets is high. One technical solution to protect whales that fisheries management keeps proposing is acoustic deterrent devices (pingers). However, because of their deterrent nature and the fact that they are a source of irritating noise for marine mammals, they are to be rejected, especially in protected areas, from the perspective of nature conservation.[22,23] **Moreover, controls and bycatch monitoring is insufficient or non-existent. It is imperative that this must be changed (see Sections 3.9 and 4.3)**.

Alternatives to gillnets are currently being assessed as part of the STELLA project (gillnet fisheries approaches, undertaken by the German Federal Agency for Nature Conservation (Bundesamt für Naturschutz, BfN) and the Thünen Institute of Baltic Sea Fisheries (Thünen Institut für Ostseefischerei, TI-OF)).[24] For greater fisheries selectivity, it is necessary to create incentives for fishermen to test these alternatives and use them. One incentive might be privileged access to certain fishing areas (see Section 5.3.1). Ideally, fishermen should contribute actively to developing environmentally-sound fishing methods, adding their own suggestions. A major advantage of this would be testing the practicability of measures in daily fishing practice and promoting their acceptance.

The reformed CFP's goal of increasing selectivity of fishing practices and fishing gear has so far not been sufficiently achieved. This is especially true with respect to non-target species such as sea birds, marine mammals, and a large number and variety of organisms that live close to the seabed. From the perspective of nature conservation, a more effective implementation of the landing obligation and more intensive research into alternative fishing gear and modification of existing gear is necessary. If promotion and use of environmentally-sound fishing techniques in practice is to increase, incentive systems and legal requirements must be created.

Harbour porpoise (Phocoena phocoena) - victim of bycatch

1.4 Is there noticeable progress towards an ecosystem-based management approach?

Determining whether there is progress towards ecosystem-based stock management requires looking at the relevant descriptors in the MSFD. There is an obvious connection to Descriptor 3, which says that all commercially exploited fish and shellfish should be within safe biological limits (see Section 4.1.2). In 2012, the German federal government described good environmental status for this descriptor with respect to the German North Sea waters as follows: "for all commercially exploited fish and shellfish populations (...) the fishing mortality rate is not greater than the relevant target value (F_{MSY}), the spawning stock biomass (SSB) is greater than MSY $B_{trigger}$, and the stocks of exploited species exhibit an age and size structure that continues to include all age and size classes approximating natural proportions."[25] Concerning the status

18 *European Commission (N.D.).*
19 *STECF (2018b).*
20 *See, for example, the Thünen Institute of Baltic Sea Fisheries (2018).*
21 *ICES (2018c).*
22 *SRU (2012).*
23 *Carlström, J. et al. (2009).*
24 *Thünen Institute (N.D.).*
25 *German Federal Government, Freie Hansestadt Bremen, Freie und Hansestadt Hamburg, Mecklenburg-Vorpommern, Niedersachen, Schleswig-Holstein (2016).*

of fish stock management, reference is made to the explanations above (see Section 6.1.2). **Even after the 2013 CFP reform, continued high fisheries pressure hinders stock recovery and the achievement of a natural age and stock structure.**[26,27]

Other important MSFD descriptors that have close ties to the ecological impacts of fisheries activity deal with the food web (Descriptor 4), biological diversity (Descriptor 1), and seabed integrity (Descriptor 6) (see Section 4.1.2). Achievement of the targets formulated for these descriptors is connected to the CFP. For instance, one of the goals is to establish multi-species management (see Art. 9 of the basic CFP regulation). Such a goal serves to take interactions of exploited species (especially predator-prey relationships) into account in stock management. From a nature conservation point of view, it is necessary to take the food needs of protected species such as sea birds and marine mammals into account. These species sometimes need the same fish species as a food source as those exploited by industrial fisheries (sand eels, sprats, etc.). This means that food webs must be considered in the management process. This is an important step in the direction of an ecosystem-based approach.[28] Implementation within the framework of the CFP is via multiannual plans. An example of this is the multiannual plan for the Baltic Sea,[29] which is based on ICES recommendations. It only affects fisheries targeting stocks of cod, herring, and sprat, summarizes existing obligations, and stipulates target values for fishing mortality rate and spawning stock biomass. Multiannual plans should contribute fully to reaching CFP goals in 2020 and thus to causing the fishing mortality rate to fall below F_{MSY} for all stocks and the landing obligation to be implemented. In this respect, the multiannual plan for the Baltic Sea, for instance, exhibits gaps in the target values. Another point of criticism is that, so far, multiannual plans have been established for few commercially important stocks.[30]

Marine protected areas are a central instrument for preserving biodiversity (MSFD Descriptor 1), especially for protected species and habitats. This includes seabed integrity (MSFD Descriptor 6), which will be addressed in the next section (Section 6.1.5). If in marine protected areas fisheries is greatly or completely restricted fisheries (no-take zones), there is a chance for stocks to develop naturally once more, which benefits fisheries by such means as spillover effects (adult or juvenile fish leave the protected area because of population density, thus contributing to supporting managed stocks outside the boundaries of the protected area).[31]

Overall, the first important steps towards ecosystem-based management of marine biological resources have been taken, such as the introduction of multiannual plans and the landing obligation. To achieve the MSFD and CFP goals, however, further steps must be taken. They include such measures as greater consideration for food webs when multiannual plans are prepared and the systematic implementation of marine protected areas.

1.5 Can sensitive habitats and species requiring special protection be better protected?

Within the framework of the Habitats and Birds Directives, a number of marine protected areas have been set up to protect sensitive marine habitats and species that require special protection. In September 2017, Germany designated its Natura 2000 areas in the Exclusive Economic Zone (EEZ) as legally binding marine protected areas.[32] Fisheries activities present the greatest threat to species and habitats occurring there.[33,34,35,36] In order to improve or conserve the status of habitats (especially reefs and sandbanks) and species (especially marine mammals, sea birds, certain fish species, and lampreys) in the marine protected areas, management measures are necessary for fishing activity. Germany cannot unilaterally limit commercial fisheries in the protected areas, since that can only be done within the framework of the CFP (Arts. 11 and 18 of Regulation No. 1380/2013) via EU Commission delegated regulations (Section 2.3.2). Member states can coordinate with affected states sharing the marine regions to prepare joint recommendations. So far (as of May 2019), coordinated recommendations for fisheries management measures have been submitted to the EU Commission only for the Natura 2000 areas in the German EEZ in the North Sea. They contain a no-take zone and various restrictions on commercial fisheries.[37,38]

26 *ICES (2018b).*
27 *For details, see the impacts of fishery on stock composition in: Kraus, G. & Diekmann, R. (2018).*
28 *See, for example, ICES (2018d).*
29 *REGULATION (EU) 2016/1139.*
30 *European Commission (N.D.).*
31 *Gell F.R. & Roberts C.M. (2003).*
32 *See Salomon M. & Schumacher J. (2018).*
33 *Sell, A. et al. (2011).*
34 *Bellebaum, J. (2011).*
35 *SRU (2012).*
36 *Kraus, G. & Diekmann, R. (2018).*
37 *German Federal Government (2018)*
38 *German Federal Ministry of Food and Agriculture (Bundesministerium für Ernährung und Landwirtschaft, or BMEL) (2019).*

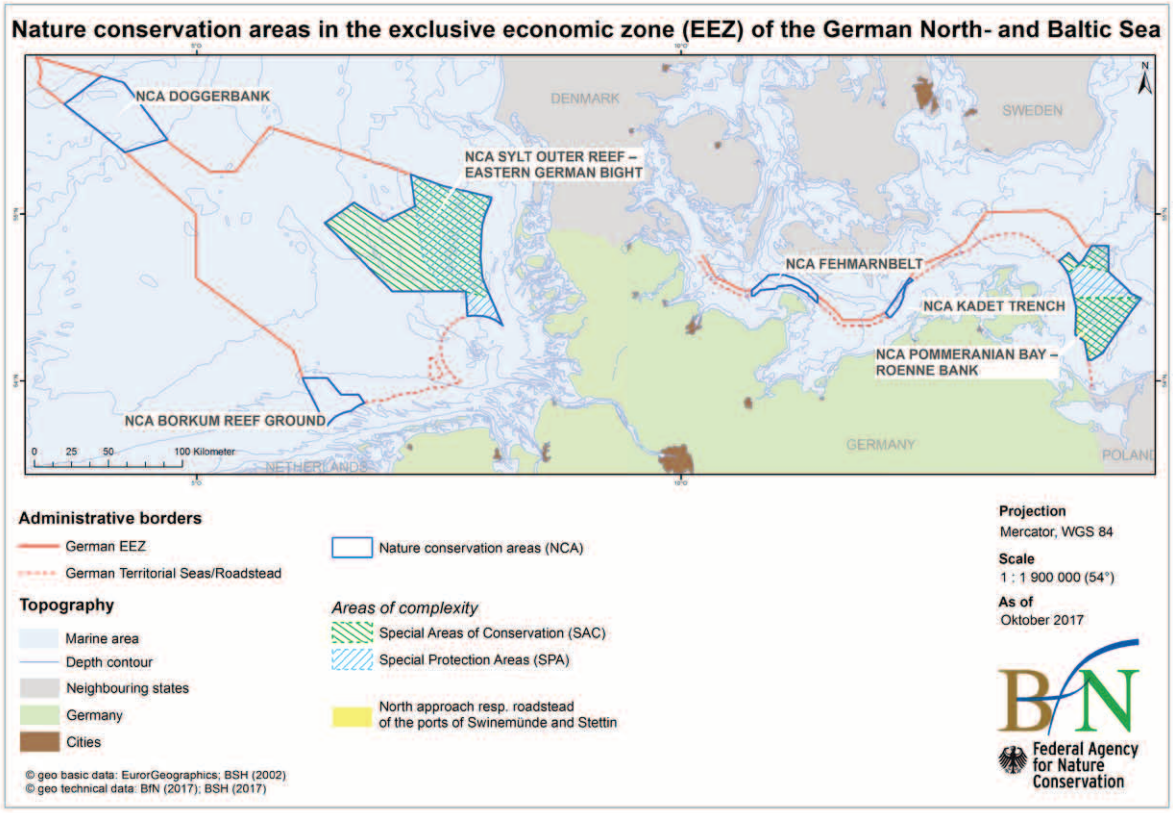

Fig.2: Nature conservation areas in the German North Sea and Baltic Sea EEZ. BfN (2017)

The joint recommendation was weakened in the final Scheveningen Group negotiation process by the economic fisheries interests of individual member states and, from a nature conservation point of view, contains several deficiencies. **For instance, the recommendation continues to countenance the use of gillnets (limited to the average fisheries intensity of the last six years) in the protected areas of Dogger Bank (Doggerbank), Borkum Reef Ground (Borkum Riffgrund) and Sylt Outer Reef (Sylter Außenriff), even though these Natura 2000 areas also serve to protect marine mammals (especially harbour porpoise).** Gillnet fishing is especially dangerous to these animals.[39] Moreover, not all parts of the Natura 2000 area of Sylter Outer Reef will be free of damaging trawling; the site is home to the sandbank and reef Habitats Directive habitat types according to the Habitats Directive and species-rich gravel, coarse sand, and shell substrate areas ("Kies-, Grobsand- und Schillgründe" (KGS), a special habitat type outlined in § 30 of the German Federal Nature Conservation Act (Bundesnaturschutzgesetz)).

Another point of criticism is that no draft fisheries management measures were published for protected areas in the German EEZ in the Baltic Sea until 2019, and the recent proposal regulated only mobile bottom-contacting fishing gear to protect habitats on the seabed.[40] What is missing are management measures for gillnet fishing. This is particularly worrisome with respect to harbour porpoise, which are split into two sub-populations in the Baltic Sea. The conservation status of the western population is moderate, while that of the eastern is very poor (unfavourable-bad in the language of the Habitats Directive).[41] Gillnet fishing is a big reason for this[42] and should be banned at least in the protected areas. There is urgent need for action, especially to help the harbour porpoise sub-population in the central Baltic Sea, which is in danger of extinction. This need for action goes beyond fisheries management for the protected areas since, according to the ASCOBANS agreement[43] and the Habitats Directive, Germany is obligated to implement an action programme for all its marine waters to conserve the harbour porpoise. There are comparable requirements for the protection of resting and wintering sea birds in the Pomeranian Bay Nature Reserve (Schutzgebiet Pommersche Bucht). Sea ducks, auks, and divers under special protection are susceptible to bycatch in gillnets, which indicates an acute need for action.[44] This means that conservation measures that affect fisheries are urgently necessary inside and outside of protected areas.[45]

It has been established that the implementation of the CFP has so far not contributed to ensuring effective protection of sensitive habitats and species in German marine waters.

39 *OSPAR Commission (2017).*
40 *German federal government (2019).*
41 *HELCOM Red List Marine Mammal Expert Group (2013).*
42 *Sell, A. et al. (2011).*
43 *ASCOBANS (2009).*
44 *Sonntag, N. et al. (2012).*
45 *SRU (2012).*

The procedure according to Articles 11 and 18 that has so far been used has proven unsuitable for initiating timely, efficient fisheries management in designated marine protected areas. The process of implementing fisheries management measures in the protected areas is, moreover, very greatly influenced by short-term economic interests of the fisheries industry. It is therefore necessary that the nature conservation requirements receive a much higher priority when management measures are developed.

2. To what extent have structural deficiencies been named, but not (or only partially) corrected, in the last reform?

The green paper on the CFP, which the EU Commission published in 2009,[46] identified the following five decisive weaknesses of the CFP:

1. a deeply rooted problem in fleet overcapacity;
2. imprecise policy goals that lead to inadequate guidelines for decisions and their implementation;
3. a decision-making system that promotes short-term thinking;
4. a framework in which the fisheries industry is not held sufficiently accountable;
5. insufficient political will to enforce requirements and insufficient compliance on the part of the fisheries industry.

The extent to which these weak points in the current CFP reform have been corrected will be addressed below.

2.1 Fleet overcapacities

One of the core problems of European fisheries policy before the CFP reform was fleet overcapacities, some of them substantial.[47] These overcapacities are not a problem for marine conservation per se as long as relevant standards for protecting stocks and ecosystems are established and implemented. But overcapacities lead to inefficiencies, posing an economic challenge. In the past, fleet overcapacities have also been responsible for great political pressure to raise catch limits to levels higher than could be countenanced from the perspective of sustainability and nature conservation. At the same time, they increase pressure on fish stocks for which there are no catch limits and contribute to exploitation of loopholes in enforcement. Fleet overcapacities in conjunction with other factors, accordingly, pose an ecological problem.

Measures for reducing fleet overcapacities that were taken before the last CFP reform as part of structural policy proved to be largely ineffective.[48,49] Responsibility for adapting fishing capacity is with the member states.[50] Under the reformed basic CFP regulation (see Art. 22), those States are obliged to identify overcapacities, report them, and reduce them by means of action plans. In the meantime, some progress has been made in this area.[51] There have been relevant fleet adjustments, but they are still insufficient. For example, the current STECF report's description of sustainable stock use in the North East Atlantic indicates that there are still overcapacities in many fleet segments. Because there is insufficient data, no general conclusions could be reached.[52] Need for action in adapting fleet capacities is especially great in the Mediterranean Sea.[53]

Even though German fisheries overcapacities have been lower than those in several other member states in the past, most fleet segments (such as small gillnet and trawl net fisheries for cod in the Baltic Sea) still exhibit a lack of balance between fisheries policy targets and fishing capacity.[54] For this reason, Germany is obligated to take further measures to adapt capacities.

Fleet overcapacitiy is still driving overfishing

46 *European Commission (2009).*
47 *Ibid.*
48 *SRU (2011).*
49 *European Court of Auditors (2011).*
50 *Salomon, M. et al. (2014).*
51 *European Commission (2016).*
52 *STECF (2018c).*
53 *European Commission (2016).*
54 *STECF (2018c).*

2.2 Imprecise policy goals

The EU Commission was of the opinion that clear priorities are necessary in fisheries policy objectives. For instance, the old CFP Regulation (EC) No. 2371/2002 formulated the goal of managing living aquatic resources in the interest of economic, ecological, and social sustainability.[55] Ecological sustainability was understood to mean no danger to future use of the stocks and no negative impacts to the marine environment.[56] To this end, the ecosystem approach was to be introduced incrementally. These targets were welcome from a nature conservation point of view, but did not result in corresponding binding obligations. For example, the definition of sustainable stock use did not prevent the Fisheries Council from prioritizing short-term economic interests over ecological ones, and thus over long-term economic interests as well.[57] To counter these tendencies, high priority must be given to ecological goals and considerations in fisheries policy in future. **The reformed CFP made the goals much more precise. However, such efforts as the process of setting catch limits since the reform (Section 6.1.2) have clearly shown that achieving ambitious goals requires not only that they be precisely formulated, but that they apply without exception and that the political will to implement them is present**.

2.3 Deficiencies in the decision-making system

Two significant weaknesses in the decision-making system of the old CFP Regulation (EC) No. 2371/2002 were that all decisions were made at the highest political level by the Fisheries Council, which governed policy implementation to the smallest detail (down to establishing certain fishing techniques in individual fisheries).[58,59] This concentration of decision-making in the Council shows that member states do not wish to relinquish responsibility for the number of fish that are caught or the means to catch them. This also favours focusing CFP implementation on short-term economic interests because the fisheries ministers traditionally place great emphasis on pursuing such interests. The ratification of the Treaty of Lisbon, which gave the EU Parliament more influence on the CFP, partially corrected this system. **For instance, Parliament must now be involved in a number of decisions. However, Parliament has no influence on the setting of annual total allowable catch levels (Art. 43 Para. 3 of the TFEU)**. This exception to ordinary legislative procedure (according to Art. 43 Para. 2 of the TFEU) is justified only if the Commission and the Council implement the targets in the basic CFP regulation when they set catch limits. If they deviate from those objectives, the Parliament must be involved. This underscores the fact that the Council and the Commission must pursue the CFP objectives. For example, after 2020, no catch limits that are above scientific recommendations can be established, in compliance with the targets in Art. 2 of the basic regulation.

More responsibility should be shifted to the regional level, especially for technical standards, so that micromanagement can be adapted more closely to special local conditions. As shown in Section 6.2.4 and elsewhere, further steps are necessary here.

2.4 Insufficient transfer of responsibility to the fisheries industry

An important standard for measuring CFP success is the extent to which the fisheries industry accepts the CFP objectives and supports the implementation of CFP goals. Without this acceptance, no sustainable fisheries can be implemented. Under the old CFP, fisheries' awareness of its responsibility was clearly deficient. One important reason for this was the top-down approach which had the Fisheries Council making all decisions down to the last detail and scarcely allowing fisheries to take any responsibility themselves. There were also hardly any procedures established for participation by the fisheries industry or other interest groups. [60,61] This deficiency was corrected when the regional fisheries advisory councils were created in 2004.[62,63] From the point of view of nature conservation, it is unfortunate that the composition of fisheries advisory councils was clearly dominated by fisheries interests.[64] **One option for improving involvement would be to establish self-management systems. The determination of method and measures, including technical measures, used to meet targets could be left to fisheries**.[65]

The new CFP represents an attempt to take initial steps in this direction by giving member states competences in specifying management plans and technical targets, primarily in cooperation with each other. Member states with direct fisheries management interests are empowered to send jointly agreed-upon recommendations to the EU Commission after the regional fisheries advisory councils have been consulted. Associated with this procedure, expert groups have been formed under the regional committees (Scheveningen Group, BALTFISH) to assume the task of preparing recommendations for technical measures (see Section 2). Individual fisheries management recommendations for marine protected

55 *Art. 2(1) REGULATION (EC) No. 2371/2002.*
56 *Art. 3(e) of Council Regulation 2371/02.*
57 *Markus, T. & Salomon M. (2012).*
58 *European Commission (2009).*
59 *Salomon, M. et al. (2013).*
60 *See, for instance, Defra (Department for Environment, Food and Rural Affairs) (2009).*
61 *O'Mahony, J. (2008).*
62 *Council of the European Union (2004).*
63 *Ingerowski, J. B. & Salomon, M. (2006).*
64 *See, for example, North Sea Advisory Council (NSAC) (N.D*
65 *European Commission (2009).*

areas agreed upon by the member states have already been sent to the EU Commission and implemented in the form of delegated acts.[66] The measure proposals for protected areas in the German EEZ that Germany submitted have been deemed by the Commission to be insufficient and must be revised. As has already been mentioned, member states have no decision-making competence and can only make requests for fisheries measures to the EU Commission in mutual agreement with the fisheries nations affected.

The reformed CFP represented a beginning (although a hesitant one) to reducing centralization and involving fisheries in the decision-making process.[67] Other interest groups, in particular environmental and conservation associations, are not sufficiently involved. More competence should be transferred to the member states, especially with respect to fisheries management measures in protected areas, in order to accelerate the implementation processes and prevent individual member states from weakening measures.

2.5 Insufficient enforcement and a culture of ignoring legal requirements

In the past, insufficient enforcement has been part of the CFP's Achilles heel. The EU has constantly attempted to reduce this deficiency.[68] One reason that doing so is the constant conflict between member states and the EU over the extent to which it is necessary to ensure or expand monitoring and sanctioning of violations. Because member states were primarily responsible for enforcing the CFP and not always convinced of its importance, deficiencies continued to appear. On top of that, the Commission scarcely had any competence to sanction violations, and there was insufficient personnel to check implementation of monitoring tasks in member states. The Commission strongly criticized the practice that existed at the time, and as a result initiated a process for revising the monitoring and enforcement system in 2008.[69] This process allowed some progress. However, the revision of the system established in 2009 also showed that there continues to be an urgent need for action and that this process has not yet been completed (see Section 3).

Improvement to monitoring of fisheries activities and sanctioning of violations is urgently necessary (Section 6.4.5). In particular, there are especially great deficiencies in monitoring small fishing vessels and violations of the discard ban.

66 *Janiak, K. (2018).*
67 *Salomon, M. et al. (2014).*
68 *Johnson, C. (2008).*
69 *Schmidt, K.-A. (2019).*

3. What goals that could improve the marine ecosystem in short order are not being properly implemented? What are the reasons for that?

3.1 TACs setting deviates from the MSY approach

As has already been mentioned, setting of catch limits is still deviating from the MSY approach. According to the basic CFP regulation, this practice must be ended by the time total fishing levels are established for 2020 so that stocks can grow back to sizes that allow management according to the ecosystem approach (even though they will now do so after the legal deadline). A reversal in management of cod stocks in the extended North Sea (including the channel and adjacent waters) and the Baltic Sea is especially urgent. To ensure these changes, all TACs without exception must remain below F_{MSY} in future. Exceeding this value stands in clear conflict with the CFP targets. If the F_{MSY} value cannot be determined, a precautionary approach with respect to the MSY approach must be taken. But this still does not achieve the goal of healthy stocks. In addition to sustainable total fishing levels, the relevant stock compositions must have an age and size structure that approaches what would be expected under natural conditions.

The decisive reason for catch limits that are too high continues to be the dominance of short-term economic interests. These interests still play an outsized role in Fisheries Council decisions. Changing this will require forcing the Council to more closely adhere to CFP requirements and implementing the mandatory MSFD targets. One way of legally requiring this at the EU level would be to expand the right of influence for conservation interests by such means as expanding the right of action (see Section 6.5.4).

3.2 Insufficient consideration given to conservation concerns in national quota allocation

The German Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung) (BLE) is responsible for the allocation of fishing quotas in Germany.[70] This distribution can also be used to mandate environmentally-sound fisheries behaviour. One option is to reserve part of the quotas for certain

70 *German Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, or BLE) (2018).*

concerns such as targeted promotion of fisheries segments that specifically use low-impact fishing methods (such as traps or weirs) or subject themselves to enhanced surveillance via remote monitoring. So far, the BLE has allocated catch quota according to the principle of relative stability (the percentage represented by a given fisherman's quota must remain constant), even though other concerns could also be taken into account.[71] **From a conservation point of view, ecological criteria should receive more consideration when catch quotas are granted. For instance, fisheries businesses using gear that avoids bycatch could be granted higher quotas.**

3.3 Landing obligation implemented too slowly

As of February 2019, the landing obligation applies to all fisheries and sea areas (see Section 6.4.6). Initial experiences with the landing obligation indicate that it is being insufficiently complied with. One important reason for this is that no effective monitoring system has so far been established. Improvements in monitoring are urgently necessary. New monitoring instruments and techniques (such as cameras on fishery vessels and sensors that capture such values as trawling speed and net fill) must be employed (see Section 3).

3.4 No effective fisheries management in marine protected areas

In 2017, Germany legally designated its Natura 2000 sites in the German EEZ as marine protected areas.[72,73,74,75,76,77] The protected area regulations govern human activity except for commercial fisheries in those areas. The preparation of management plans for fisheries is urgently necessary. As has been mentioned, recommendations for the protected areas in the North Sea and for trawling in the Baltic Sea have been agreed upon (Section 6.1.5). **The protection of marine mammals and diving sea birds urgently requires that a proposal for gillnet fisheries management in protected areas in the German EEZ in the Baltic Sea be prepared and implemented.**

As part of implementing the MSFD in Germany, no-take zones are to be established to serve functions including providing reference areas (see MSFD Recital 39), protecting species, habitats, and ecological processes.[78] So far there are no no-take zones in the German EEZ, and only a small part of the Amrum Bank (about 25 % of the area, or about 22 km²) is intended for such areas.[79]

From a conservation perspective, it is necessary to create areas in which no human use, including fisheries, is permitted (no-take zones) that are large enough to achieve the MSFD conservation goals with respect to the food web (Descriptor 4), biodiversity (Descriptor 1), and seabed integrity (Descriptor 6).

Large marine protected areas are much-needed

71 *Vollmer, K. (2017).*

72 *Regulation for the establishment of the Borkum Reef Ground conservation area (Verordnung über die Festsetzung des Naturschutzgebietes "Borkum Riffgrund", or NSGBRgV).*

73 *Regulation for the establishment of the Kadet Trench conservation area (Verordnung über die Festsetzung des Naturschutzgebietes "Kadetrinne", or NSGKdrV).*

74 *Regulation for the establishment of the Sylt Outer Reef- Eastern German Bight conservation area (Verordnung über die Festsetzung des Naturschutzgebietes "Sylter Außenriff- Östliche Deutsche Bucht", or NSGSyiV).*

75 *Regulation for the establishment of the Dogger Bank conservation area (Verordnung über die Festsetzung des Naturschutzgebietes "Doggerbank", or NSGDgbV).*

76 *Regulation for the establishment of the Pomeranian Bay- Rønne Bank conservation area (Verordnung über die Festsetzung des Naturschutzgebietes "Pommersche Bucht - Rönnebank", or NSGPBRV).*

77 *Regulation for the establishment of the Fehmarn Belt conservation area (Verordnung über die Festsetzung des Naturschutzgebietes "Fehmarnbelt", or NSGFmbV).*

78 *Bundesregierung, Freie Hansestadt Bremen, Freie und Hansestadt Hamburg, Mecklenburg-Vorpommern, Niedersachen, Schleswig-Holstein (2016).*

79 *German federal government (2018).*

4. How can existing instruments be better supported and given appropriate effectiveness so that the integration of nature conservation issues into the CFP does not come to nothing?

4.1 Orient scientific advice more precisely towards CFP and MSFD targets

The scientific recommendations prepared by the International Council for the Exploration of the Sea (ICES) and STECF are the decision-making basis for sustainable stock management. These recommendations must follow the CFP goals. One of the essential goals of the CFP is for fish stocks to achieve a biomass that is higher than that which allows a MSY. Scientific advice should be especially focused on how stocks that still need to grow to this size can do so. The reference point for this endeavour is B_{MSY}, the biomass a fish stock must achieve so that it can allow MSY in the long term. So far, ICES has provided a B_{MSY} value for few stocks, though the number of stocks for which that value is available is growing slowly. Instead, a value for MSY $B_{trigger}$, the lower limit of the fluctuation range around B_{MSY}, is indicated (see box below), and the value for B_{pa} (precautionary reference point for the spawning biomass, see Section 1.1) is used as a proxy for MSY $B_{trigger}$. In 2016, the latter was used for 66 % of 50 stocks assessed with respect to the MSY approach.[80] For some of them, both values are clearly below the target B_{MSY} value.

Criticism of the basics of catch limit determination

The decisive sizes for checking the CFP targets are B_{MSY} for stock size and F_{MSY} for fisheries pressure (or the fishing mortality rate) if these values can be determined. Because there is often no value for B_{MSY}, conclusions about other quantities such as B_{pa} and/or MSY $B_{trigger}$ are drawn, but those quantities are generally less than B_{MSY}. Moreover, a range ($F_{MSY\ ranges}$*) is indicated in some cases in addition to F_{MSY}.[81] But the top end of $F_{MSY\ ranges}$ ($F_{MSY\ upper}$) is much higher than F_{MSY}. Orienting on the top end of the $F_{MSY\ range}$ when setting catch limits contributes to allowing too many fish to be caught and preventing the CFP targets from being reached in the near future. That is why the reference points used as the basis for setting catch limits are only marginally suitable, since they do not (or at least not completely) conform to the CFP targets.

80 *Poseidon Aquatic Resource Management Ltd (2017).*

81 *ICES (2018e).*

* *$F_{MSY\ ranges}$ – Range of fishing mortalities (F) that lead to an average catch of at least 95 % of MSY in long-term simulations.*

Future stock management requires greater orientation on B_{MSY} than there has previously been or the use of proxies that credibly approximate B_{MSY}. There are proposals for such proxies that could be taken up.[82,83] For instance, a simple option would be to use the value for B_{pa} (the "old" precautionary reference point which, as has been mentioned, is often available) multiplied by two. Otherwise, the impression could be given that achieving a stock size of MSY $B_{trigger}$ is the equivalent of achieving the CFP target – and that is not the case. Moreover, it is necessary for spawning stock biomass (SSB) data to be available. It has been available for only part of the stocks – in 2016, for only one third of the managed stocks in the North East Atlantic.[84] **That is why it is important to determine the stocks for which further data basis improvement is possible and the measures necessary for that improvement.**

ICES is now also preparing recommendations for multi-species management; these recommendations are very important for a stronger ecosystem-based approach to stock management. Here, the scientific recommendations go so far as to contradict the CFP requirements: For instance, it is recommended that cod and saithe (pollack) be fished to a slightly greater extent in the North Sea than the MSY target specifies (grant quotas that are more than F_{MSY}) to reduce predation on prey species such as whiting (*Merlangius merlangus*).[85] An approach that violates the rules to this extent could not be justified.

What is needed are recommendations on how to achieve the MSFD goal of conserving stocks with mixed, nearly natural age and size structures. Recommendations for the relevant indicators have already been prepared.[86] ICES is currently assessing stocks based on only two of the three MSFD criteria. These criteria are used to determine the "good environmental status" of a stock or population.[87]

4.2 Continue to reduce fleet overcapacities

The EU-wide adaptation of fleet capacities to fishing opportunities has not yet been completed. As has been mentioned, there are overcapacities in individual fisheries segments in Germany, too.[88] The German action plan for the 2017 fleet report contains a number of measures that would serve to implement further balancing.[89] For instance, money from the EMFF (European Maritime and Fisheries Fund) for modernizing the fleet is being linked to reducing capacities, a shift of fishing capacity from the Baltic Sea

82 *See Froese, R. et al. (2016).*

83 *Poseidon Aquatic Resource Management Ltd (2017).*

84 *Ibid.*

85 *ICES (2018b).*

86 *ICES (2017).*

87 *ICES (2018b).*

88 *STECF (2018c).*

89 *German Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, or BLE) (2018).*

to the North Sea is planned, and public funds are being provided to scrap fishing vessels in fleet segments with overcapacities. Moreover, efforts are being made for fisheries businesses to focus on fishing healthy stocks, refrain from exhausting all quotas, and exchange quotas. The latter helps the fisheries to better take advantage of their quotas. One of the goals is a shift of quotas to coastal fisheries so that its quota endowment and thus its fishing capacity is improved. Marketing measures are being promoted to support fishermen. **The measures cited are welcome, but it remains Germany's responsibility to assess whether they will cause fleet capacities and fishing opportunities to be brought into balance in the near future**.

4.3 Use the regional approach for ecosystem-based management

Member states are challenged, but not required, to cooperate regionally to prepare recommendations for conservation measures. All member states with management interests should be involved and fisheries advisory councils consulted. This opportunity is sometimes taken advantage of and sometimes not. There are also situations in which the member states have difficulty reaching a consensus. According to Art. 11 Para. 4 of the basic CFP regulation, the EU Commission has the option of stepping in when such cases arise. So far, it has rarely exercised this option – and one possible reason for this is that the measures it can impose are of limited duration (12 months with a possible extension to a maximum of 24 months). More EU Commission activity is desirable so that the CFP targets can be reached within an appropriate period of time.

4.4 Optimize technical measures and increase selectivity

Technical measures that determine how and where catches are made serve to protect both resources and the ecosystem. One of their purposes is to prevent bycatch of juvenile fish and non-target species and severe damage to communities on the seafloor. The landing obligation creates an important incentive to employ more selective fishing techniques. Newly developed nets, such as those with exit windows, have showed in tests that much higher selectivity is possible.[90] There are also alternatives to using heavy trawls, which are especially harmful to benthic communities.[91] **From a nature conservation point of view, the development of alternative fishing gear that prevents bycatch in gillnet fisheries, including sea birds and marine mammals (especially harbour porpoise) continues to be important, as does the use of fishing techniques that are less harmful to the ecosystem**.

Because of the incomprehensibility of the many and varied technical requirements, there is the desire, particularly on the part of fisheries, that they be better structured. The EU Commission has proposed regulation to this end. Among other things, it distinguishes between general and regionally specific technical requirements.[92,93] The proposal is a welcome one, but only creates a legislative framework within which the technical requirements are to be refined taking marine conservation issues and the MSFD into consideration. **It is important to continue research on environmentally-sound fishing techniques, in cooperation with other member states if possible, and to promote such research wherever there are not yet technical solutions.** Moreover, it should be assessed whether technical measures that have previously been rarely applied can make a further contribution to ecosystem-based management. Among these measures are real-time closures and the establishment of stock recovery areas, including protected spawning areas, to compensate for special sensitivity.

Alternative fishing gear urgently needed to prevent bycatch of marine mammals and sea birds

4.5 Reform the fisheries control regulation

The changes to the fisheries control regulation proposed by the European Commission, such **as improvements to spatial monitoring and reporting requirements of small fishing vessels, are urgently necessary.** Recreational fishing should also be obligated to document and report catches. For monitoring the landing obligation, cameras and/or sensor-supported techniques should

90 *Zimmermann, C. et al. (2015).*
91 *WWF (2014).*
92 *Zimmermann, C. et al. (2015).*
93 *WWF (2014).*

be introduced on board. It is also desirable to establish minimum requirements, such as an increased VMS (Vessel Monitoring System) frequency, for spatial monitoring of marine protected areas. The first draft for fisheries management in the protected areas in the German EEZ in the North Sea delivers a useful proposal for this (increasing VMS frequency to ten minutes upon entry into protected areas' 4-sm safety zone). Improving the quality and reliability of data captured and their exchange among responsible institutions is also necessary.

The implementation of efficient monitoring of management measures in protected areas is an essential foundation for achieving the conservation goals in designated marine protected areas. For efficient implementation of monitoring measures, a uniform set of regulations should be the goal within the framework of the fisheries control regulation.

4.6 Remove exceptions to the landing obligation

The new basic CFP regulation imposes the obligation of landing caught fish of important commercial species unless the species are endangered or the fish that have been caught are of a species that will probably survive discard (Table 2). The de minimis exception also allows 5 % of the catch to be discarded under certain conditions (Section 2.5.1). The last two exceptions mentioned cannot be countenanced in their current form from a nature conservation point of view. For instance, the term "high survival rate" has yet to be defined. Moreover, this rate is dependent not only on the species caught and the fishing gear used, but also on a number of other factors, such as how the catch is handled on board.

Fishermen also have the ability to count the catch of the bycatch species against the target species quota up to a certain percentage or to "borrow" up to 10 % of the next year's quota, which means catching more in one year and having the excess subtracted from the following year's quota. However, borrowing against future quotas is not linked to any conditions in the basic CFP regulation, but, like quota transfers between species, should be permitted only if the affected stock is within safe biological limits and exhibits a clearly positive development.

Moreover, there has been criticism from conservation activists that the landing obligation does not apply to all species; it excludes those that are protected – but not those for which there are no quotas.[94] **It is important to optimize fishing methods for greater selectivity for these species as well and to acquire data about their bycatch. The de minimis rule should also be eliminated. And discard because of a high survival rate should be allowed only when such a rate is guaranteed for a large proportion of the fish (> 90 %) and careful handling of bycatch on ofboard fishing vessels is ensured. The data gaps on these items should be closed.**

94 SRU (2011).

Exception from the landing obligation	Note	Assessment
Protected species	Bycatch must be avoided as much as possible	●
High survival rate (species may be released)	High survival rate is not defined (should be more than 90%) Depends on many factors Not yet sufficiently researched (especially the medium-term survival rate)	●
de minimis (up to 5% of the total catch weight may be discarded)*	Reduced pressure to use selective fishing techniques Conditions for this exception are not clearly defined Extremely difficult to monitor	●
Option for quota deviation		
Counting the catch of the (limiting) bycatch species towards the target species quota (up to 9% of the target species quota if the limiting non-target stock is within safe biological limits)	Low incentive for fishermen to count the catch of commercially unimportant species against the quota of a commercially important species	●
Member states can borrow up to 10% of the following year's quota	Borrowing increasing pressure on the stock for a short time On the other hand, fishermens "bunker mentality" (reserving a part of the quota for a rainy day) can provide short-term relief for stocks.	●

● = accepted according to nature conservation issues

● = acceptable under certain conditions

● = should always be rejected

* = only if increasing selectivity is very difficult or the treatment of the undesired catch results in disproportionately high costs

Table 2: Exceptions from the landing obligation/Options for deviations from quotas and their assessments. Data source: Basic CFP regulation[95]

4.7 Push implementation of fishing restrictions in marine protected areas

Nature conservation measures in marine protected areas affecting commercial fisheries cannot be initiated by member states themselves in their sovereign waters, but only within the framework of the CFP (Section 6.1.5). It is up to the member states to prepare joint recommendations in cooperation with other member states with economic fisheries interests in the affected area. **Because the process of gathering support for a recommendation can be very difficult, the EU Commission should assume a greater mediation role to allow realization of effective Natura 2000 measures in marine protected areas.** When member states cannot reach a consensus, the Commission should make use of its capability of preparing a proposal that is in conformity with the law or to improve a submitted proposal that is deficient.

95 *Zimmermann, C. et al. (2015).*

4.8 Better implement fish stock recovery areas

According to the CFP, protected areas can be set up for stock management reasons as well. They can serve such ends as preventing or minimizing disruptions in spawning or nursery areas. However, such protected areas need time to develop effectiveness. The cod stock in the western Baltic Sea is an example of why it is not a good idea to set up such sanctuaries for a short time only; they need time to become effective.[96] **Spatial fisheries limits should therefore apply for a long time, and their effectiveness should be monitored by means of a suitable monitoring system.**

5. What further instruments would be suitable for bringing about the desired positive CFP effects?

5.1 Make catch quotas (and their allocation) more flexible

One of the central goals of the last CFP reform was to eliminate fish discard and thus inefficiencies and resource wastage in fisheries. It was also hoped that this would contribute to recording the entire catch, including bycatch, providing a better data basis for stock management. The landing obligation was also developed in this context and is being implemented by means of relevant discard plans in the form of delegated acts.[97] What is problematic here, however, is bycatches in so-called mixed fisheries (that in which various target species are caught at the same time). The challenge is that fishermen have a certain quota for each species, but these quotas do not per se reflect the relationship to one another of the species caught. Whenever the quota for one species is filled or the fisherman has no quota for the bycatch species, the fisherman must stop fishing (see Section 2.5.3). The worry is that fishing activities will be continued under these conditions and the specimens of the species for which the quota has been exhausted will be illegally thrown overboard again.

To prevent such occurrences, primary attention should be given to using selective fishing methods (see Section 6.4.4). Among these methods are appropriate nets, but also adaptation of fishing behaviour, such as avoiding fishing areas with high occurrences of juvenile fish or non-target species.[98] Moreover, it is conceivable that quotas could be adjusted to the catch retroactively. For instance, the member state or responsible institution could redistribute quotas after the fact. Another possibility is reserving an appropriate proportion of quotas for bycatches from the very beginning and assigning them as necessary. Systems could also be established or optimized at the member state level to allow fishermen to exchange quotas among themselves. Such a system would function, however, only if the fisherman finds someone who is prepared to exchange the required quota for a quota that has not been exhausted. The CFP also allows member states to initiate tradable quotas, which has long been the practice in some non-EU countries (Art. 21 of the basic CFP regulation).[99, 100]

More flexibility in the allocation of quotas, or to make the quotas themselves much more flexible by an exchange or tradable system can help solve the discard problem in mixed fisheries. Care must be taken in the implementation of such systems that the targets of the CFP and the MSFD are met. For instance, fisheries pressure on a given stock must not in any case be increased to an impermissible degree by transferring quotas from one species to another.

5.2 Establish programmes for monitoring bycatch of protected species

Bycatch of protected species, especially marine mammals and sea birds, is a major problem and impedes the achievement of marine conservation goals. The absence of reliable data makes it difficult to adequately evaluate this intervention in fisheries and to take effective measures. For this reason, and in adherence to requirements and obligations from nature conservation, Germany should establish a monitoring programme for bycatches of protected species. In its own interest, fisheries should contribute seriously to this effort in order to escape being viewed merely as a cause of the problem. If there are no specific data about the extent of non-target catches, the precautionary principle should be applied and the highest likely bycatch rate assumed.

96 *ICES (2018c).*
97 *European Commission (2019).*
98 *Zimmermann, C. et al. (2015).*
99 *Sveriges Riksdag (2016).*
100 *Hentrich, S. & Salomon M. (2006).*

Dead Northern gannet (Morus bassanus)

5.3 Support of in-shore fisheries with new sources of income

Fishermen in Germany traditionally earn their money primarily by selling their catch. Fishing uncomplemented by other activities is often not very financially viable, especially for small in-shore fisheries.[101] On the other hand, these fisheries represent an important factor in maintaining tradition and for tourism in coastal regions. Alternative sources of income can help preserve these fisheries and the associated jobs. Countries such as Spain are already engaging in so-called nautical tourism, which gives tourists the opportunity to go out with fishermen and experience the sea and fisheries first-hand. Similar models are plausible for Germany and should be supported by the German federal government or the federal state governments. Another option is direct marketing of fisheries products by the fishermen being supported. **New sources of income would also reduce the business demands for fishermen to maximize their catches, perhaps making them more receptive to more environmentally-sound fishing practices.**

5.4 End subsidies that damage the environment

Subsidies that fly in the face of nature conservation considerations are a problem in fisheries as well. In the past, they have made a considerable contribution to generating the great overcapacities of the European fishing fleet.[102] They pose a problem even when they do not directly contribute to expanding capacity, but allow fisheries that would fail without subsidies to remain in the market. For this reason, it is important that all forms of subsidy be assessed critically. This is true of all subsidies that Germany provides to fisheries , including the tax exemption of marine diesel.

101 *STECF (2018a).*
102 *Markus, T. (2010).*

Some fisheries[103] practices – especially trawling with conventional beam trawls – require an especially large amount of fuel. The use of this heavy fishing gear is associated with great damage to benthic organisms and habitats.[104] **For this reason, marine diesel for fishing vessels should be taxed at a rate comparable to that for diesel in commercial road traffic. This would, among other things, create an incentive to use fuel-saving techniques and environmentally-sound fishing methods.**

5.5 Expand the right of action at the European level

So far, there has been a limited right of action, especially for interest groups committed to the concerns of ecological sustainability in fisheries (in particular environmental and conservation associations) when total allowable catch limits that do not meet CFP requirements are ratified.[105] **Right of action should be expanded as an additional option for bringing much greater discipline to the EU Council in its ratification of catch limits.** Deviation from scientific recommendations would then be much more difficult than it has been and must be very well justified.

103 *See the information provided by the German Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, or BLE) (N.D.).*
104 *German Federal Agency for Nature Conservation (Bundesamt für Naturschutz) (N.D.).*
105 *Markus, T. (2010).*

6. Conclusions

From an nature conservation point of view, progress with respect to sustainable use of biological resources is being made too slowly in European fisheries policy. This is particularly noticeable in the annually set catch limits and the implementation of the landing obligation.

Some of the annually set total allowable catch limits still deviate greatly from scientific recommendations, and this is unacceptable. At the same time, scientific recommendations are still not completely oriented towards the CFP targets, and those targets are not being sufficiently implemented in policy action.

By 2020, no catch limits that do not conform to the MSY target may be ratified. Thus fishing mortality rate for all stocks will have to be below F_{MSY} . To the extent that no value can be determined for F_{MSY} , the precautionary approach is to be used in a form that ensures that no deviation is made from the MSY approach. But this still does not achieve the target of conserving correspond stock biomass levels (> B_{MSY}), let alone that of stock composition that exhibits an age and size structure approaching a natural one. Stocks that fulfil these criteria would not only be more ecologically stable, but could also return greater yields, given careful management, than overfished stocks. **Unfortunately, those responsible still have not grasped the fact that the negative consequences of missing the MSY targets affect fisheries as well.** The goal of ecosystem-based management must therefore be pursued with greater emphasis by such methods as granting the relevant advocates (such as environmental and conservation associations) greater influence.

To implement the landing obligation, solutions for mixed fisheries are especially important, since it involves special bycatch challenges. **But as long as the fisher's quotas do not correspond to the catch composition and cannot be adapted to it adequately, there is an incentive to illegally throw overboard species for which the quotas have been exceeded. The central concern of the landing obligation must be that fishermen use more selective fishing methods, and some of these methods have yet to be developed. It is imperative that the described exceptions to the landing obligation do not weaken efforts to achieve this goal.**

Another deficiency is the inadequate grasp of the value of intact marine ecosystems and the necessity of ecosystem-based management of marine biological resources. **The prohibition of harmful fisheries activity in marine protected areas and the establishment of no-take zones constitute an important component of sustainable, ecosystem-based fisheries. For the marine protected areas in the German EEZ, there are as yet no fisheries management measures; coordinated recommendations have been sent to the EU Commission for the North Sea only.**

The standards for commercial fisheries must ensure that Natura 2000 targets are achieved. This applies both to the favourable conservation status and to compliance with the no-deterioration rule.

There are also deficits in enforcing the CFP, and an effective monitoring system for the landing obligation has yet to be established. One indispensable condition for this is the use of appropriate onboard technology. Fishing capacity must also be further adapted to fishing options. This means that a number of further efforts are needed if the CFP is to be implemented, and it is very likely that several challenges will persist until 2023 and beyond, especially since the described weaknesses in the landing obligation and in regionalization can be corrected only by revising the rules. **But without the political will to implement sustainable fisheries policy, the proposed improvements will not achieve the targets.**

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Requirement catalogue for achieving CFP sustainability targets

Some of the following requirements are based on implementing the current CFP (•), and some are improvements to be made to the CFP (»)

1. Setting catch limits

- Set total catch limits on the basis of scientific recommendations: The Fisheries Council must be more significantly constrained by the requirements of the CFP and the MSFD in the interest of achieving the obligatory targets
- Consider conservation and environmental issues when distributing national quotas (for instance, assign higher quotas to fishery operations employing fishing gear that avoids bycatch, or engage in regional area-based fishery management)

» Expressly expand the right of action for recognised non-profit environmental and conservation organisations at the European level as an additional option for bringing much greater discipline to the EU Council, compelling it to consider CFP targets in its ratification of catch quotas

2. Completely implement the landing obligation

- Completely monitor the landing obligation, using such means as observers on vessels and sufficient inspectors in harbours
- Mandate the use of new, effective monitoring instruments and techniques (such as sensors that capture trawling speed and net fill, and cameras on fishing vessels)
- Abolish exceptions to the landing obligation (such as the de minimis rule)
- During national distribution, reserve quotas for unintentional catches of non-target species in order to solve the "choke species" problem in mixed fisheries and prevent discards

» Expand the landing obligation to encompass all fish species (with the exception of species under special protection and those with high discard survival rate) to optimise fishing method selectivity and document bycatch

3. Monitor and sanction

- Completely monitor all fishery activity, especially that of small fishing vessels
- Consistently sanction failure to comply with legal requirements, especially violations of the landing obligation
- Improve real-time monitoring of fishery activity by such means as increasing VMS frequency, using AIS data, especially in marine protected areas and, as necessary, areas with high incidences of juvenile fish and non-target species where fishing is prohibited

4. Increase fishing gear selectivity

- Expand research and development for alternative, environment-friendly, selective fishing gear that avoids bycatch
- Mandate the use of existing, environment-friendly, selective fishing techniques by creating legal requirements and introducing incentive systems
- Foster intensive member state cooperation in researching alternative fishing gear

5. Push ecosystem-based management of marine biological resources to achieve MSFD and CFP goals

- Increase consideration of food webs and ensure sufficient availability of food for protected species such as sea birds and marine mammals when multiannual plans are developed, and expand those plans to encompass all fish species exploited by the EU
- Improve implementation of spatial fishing closures (including spawning areas) of sufficient duration and effectively assess that implementation by means of monitoring

6. Implement effective fisheries management measures in marine protected areas

- Quickly and systematically comply with fisheries regulations and implement effective fisheries management measures in protected areas
- Establish no-take zones to achieve MSFD conservation goals with respect to the food web, biodiversity, and seabed integrity

» Establish effective fisheries management measures in marine protected areas by transferring the lead role in application and implementation procedures to the conservation agencies at the national and European levels, and give the EU Commission the role of actively mediating between member states where there is disagreement. Abandon the principle of joint (unanimously decided) recommendations according to Art. 11 Para. 3 of the CFP reform if such a principle weakens conservation efforts. Clearly specify a period of no longer than three months to clarify conflicts after a recommendation has been rejected by the Commission/Parliament

7. Remove subsidies and adapt fleet capacities

- End environmentally harmful subsidies; for instance, marine diesel for fishing vessels should have the same tax rate as diesel in commercial road transport
- Reduce fishing capacity in order to achieve a balance with the goals of fishery policy (such as for gillnet or trawl net fishing for cod in the Baltic Sea)
- Create further incentives for fuel-saving techniques and environmentally-sound fishing methods

8. Improve scientific consultancy orientation towards CFP and MSFD targets

- Orient stock management on B_{MSY} only (or, as necessary, use a proxy that credibly approximates B_{MSY})
- Clearly improve the data basis for determining spawning stock biomass (SSB)
- Obtain recommendations on measures for conserving stocks with mixed, nearly natural age and size structures (MSFD target)

9. Establish programmes to monitor bycatch of protected species

- Improve collection of fishing effort data, especially from small vessels not subject to the VMS requirement (less than 12 metres long) or log book requirement (less than 10 metres long)
- Monitor bycatch of protected species by means of cameras or observers on vessels in the relevant fleet segments

10. Support in-shore fisheries with new sources of income

- Support local direct marketing
- Create options for generating income via tourism

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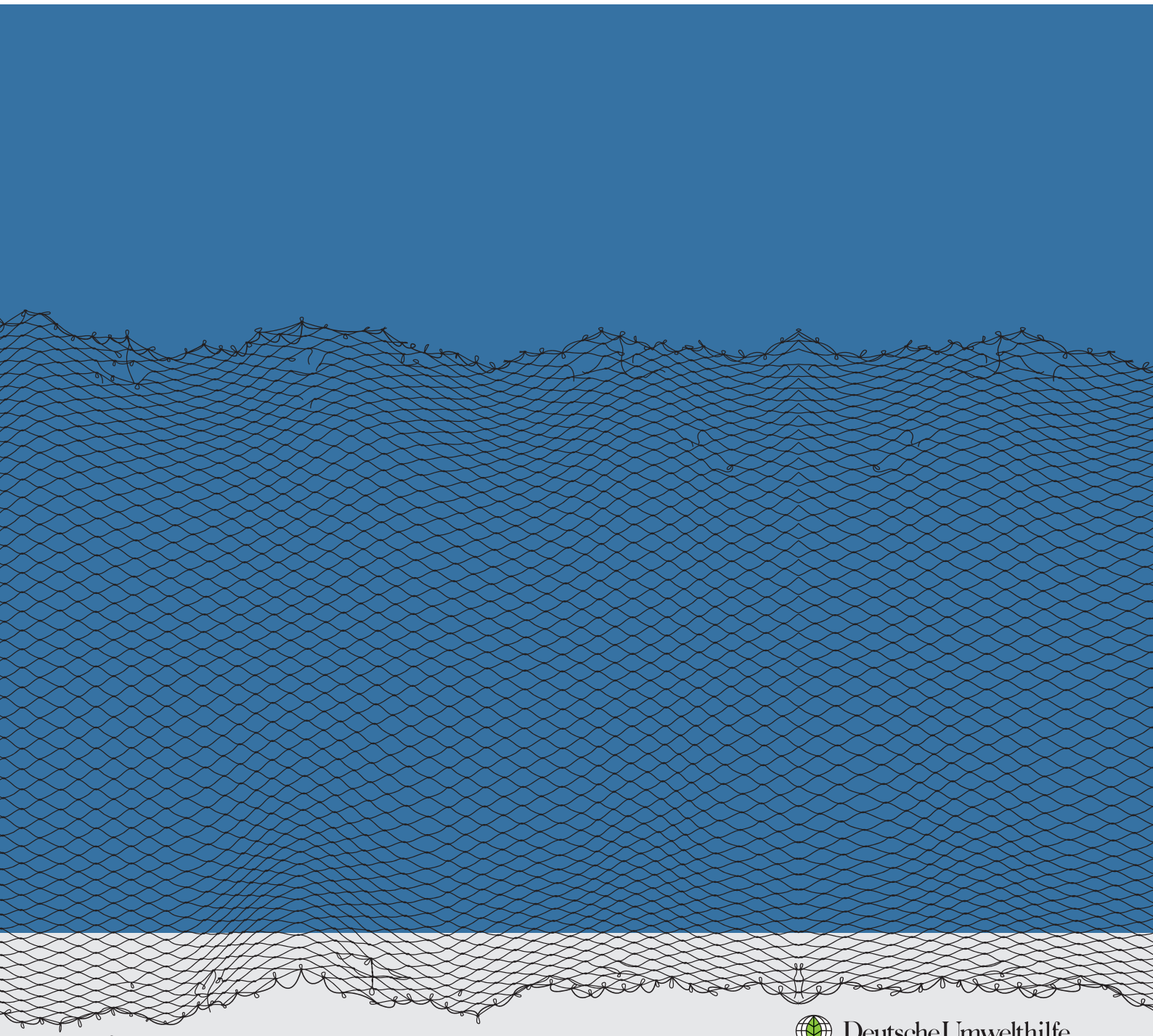

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