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FISHERIES –

TAC adjustments for stocks subject to
the landing obligation (STECF-15-17)

PLENARY MEETING,
9-13 November 2015, Brussels

Edited by Norman Graham, Nicholas Bailey & Steven Holmes

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Abstract

The Commission is proposing so-called quota "top ups" for all the fisheries under the landing obligation as of 2016 and requested advice from the Scientific, Technical and Economic Committee for Fisheries (STECF) on this topic. The STECF issued its advice during its 50th plenary on 9-13 November 2015 in Brussels (Belgium). Tables 4 and 7 of the annex ad hoc report were updated on 18th November 2015.

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REPORT OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES

TAC ADJUSTMENTS FOR STOCKS SUBJECT TO THE LANDING OBLIGATION (STECF-15-17)

ISSUED AT PLENARY MEETING

9-13 NOVEMBER 2015, BRUSSELS

1. INTRODUCTION

The STECF plenary took place at the MAI – International Association Centre, rue Washington straat 40 – B-1050 Brussels, from 9 to 13 November 2015. The Chairman of the STECF, Dr Norman Graham, opened the plenary session at 09:00h. The terms of reference for the meeting were reviewed and discussed with DG MARE focal points before and consequently the meeting agenda agreed. The session was managed through alternation of Plenary and working group meetings. Rapporteurs for each item on the agenda were appointed and are identified in the list of participants. The meeting closed at 16:00h on 13 November 2015.

2. LIST OF PARTICIPANTS

The meeting was attended by 23 members of the STECF, three invited experts and four JRC personnel. Nine Directorate General Maritime Affairs and Fisheries (DG MARE) attended parts of the meeting. Section nine of the present report provides a detailed participant list with contact details.

The following members of the STECF informed the STECF chair and Secretariat that they were unable to attend the meeting:

Alyne Delaney
Simon Jennings
Andrew Kenny
Sakari Kuikka
Hilario Murua
Jenny Nord
Francois Theret
Willy Vanhee

3. BACKGROUND

Member States regional groups have identified fleet segments which in 2016 will be subject to the landing obligation as well as specific conditions under which a limited amount of discards may

continue¹. These fleet segments have been defined on the basis of catches of targeted species by certain fleets operating in different areas. The CFP allows for TAC adjustments to be made for those stocks under the landing obligation, recognising that fish that otherwise would have been discarded is now to be landed. These adjustments are to be made on the basis of the contribution by the fleets under the landing obligation to total catches and discards of the concerned stocks.

The task of this ToRs shall be carried out on the basis of the input from JRC. It should be noted that in the absence of definitive identification of vessels subject to the landing obligation in 2016 (through the lists of vessels that MS are required to prepare under the delegated acts of discard plans), STECF is asked to identify the fleet segments concerned on the basis of the annexes to the joint recommendations and other available data and knowledge.

DG MARE issued an ad hoc contract with the below listed ToRs in preparation for the plenary meeting. The report of the adhoc contract can be found in section ten (ANNEX) of the present report.

4. REQUEST TO THE STECF

On the basis of the ad hoc contract, the STECF is requested:

1. To provide information on (i) the contribution² (%) of each fleet segment identified under the Member States' joint recommendations to total catches and discards of the stocks/TACs in Table 1 and (ii) the discard rate³ of each fleet segment in relation to the same stocks/TACs in Table 6.5.1.

Table 6.5.1.

North Western Waters	South Western Waters	North Sea
Whiting ICES Areas VII b,c,e-k	Hake VIIIc, IX and X; Union waters of CECAF 34.1.1	Saithe in ICES Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIIId,	Common sole VIIIa and VIIIb	<i>Nephrops</i> in Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIIe	Hake VIIa, VIIIb, VIIId and VIIe	Common sole in Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIIb,c	Common sole VIIIc, VIIId, VIIe, IX, X and CECAF 34.1.1	Northern prawn in Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIIIf,g	Plaice VIII, IX, X and Union waters CECAF 34.1.1	Plaice in Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIIh-k		Hake in Areas IV, IIIa and IIa (EU)
Hake VII VI and VII and Union waters of Vb		Haddock in Area IIIa
<i>Nephrops</i> Area VII		
<i>Nephrops</i> Area VI		
Haddock Area VIIa		
Haddock Ices Area Via and Union waters of Area Vb		
Whiting ICES Area VIIId		

1 Member States' Joint Recommendations.

2 Over the last 2 years on average (2013, 2014).

3 Discards relative to catches of the concerned stock on a fleet basis only.

2. In the absence of discard information per fleet segment or partial fleet segment to comment, for each of the concerned stocks, on the likelihood that fishing mortality will increase if the average discard rate⁴ given by ICES for the entire stock is used as an approximation to calculate discards for the fleets under the landing obligation (as defined in the Joint Recommendations provided by the Member States regional groups).

For each stock where STECF identifies a high risk level associated with using the average discard rate, STECF is requested to comment on whether an alternative discard rate could be applied for the purpose of calculating TAC adjustments.

5. STECF OBSERVATIONS

The background to this request outlines the provision in the CFP Regulation for TAC adjustments to be made for stocks under the landing obligation, recognising that from 1 January 2016, some species that otherwise would have been discarded will have to be landed (Article 16.2 Council Regulations (EC) No 1954/2003). The request relates to TAC adjustments and involves a review of an ad hoc contract which identifies available landings and discard data.

STECF notes that the ad hoc contract report has extracted, analysed and presented appropriate data from the report of the STECF Expert Working Group on the Evaluation of Fishing Effort Regimes in European Waters (STECF 15-12), using national data supplied by each Member State, under the DCF requirements (. The report has identified for the three regional areas (NW waters (NWW), North Sea (NS) and SW waters (SWW)) the relevant species and fleets which will potentially become subject to the landings obligation in 2016. The data are tabulated in an informative structure which indicates the different ways in which vessels will be defined in the different regions (e.g. on gear and mesh size basis in the North Sea compared with a catch composition approach in the NWW).

STECF notes that while the correct material has been used to prepare the report, all the reservations and concerns previously expressed by STECF (for example STECF 2015b) over data quality, coverage and variability remain. Nevertheless the material used represents the most readily available disaggregated information on fleet landings and discards and this has been used in the production of regional discard atlases. STECF draws attention to the equally important information contained in the ICES stock forecast advice and has further elaborated on this below.

In addressing the first ToR, the report concludes that information on the contributions of different fleets to the total catch and discards of species and information on discard rates is available from the STECF database for almost all of the stocks defined in the Delegated Acts for the NWW, NS and SWW. STECF concludes that tables presented in the ad hoc report efficiently summarise the relevant information.

STECF notes that there is only one stock, Northern prawn, to which the delegated acts would apply which did not have catch information for all fleets in the STECF database (the second ToR). STECF considers it appropriate to use the ICES discard estimates, and the application of these estimates for

⁴ The rate of discards (unwanted catches) relative to total catches in ICES advice on catch options for 2016.

TAC adjustments is unlikely to result in an increase in fishing mortality on Northern prawn. For sole and plaice in ICES IIa, which are also listed in the delegated act for the North Sea, there is no evidence of catches from any available sources. Sole and plaice in ICES X and CECAF 34.1.1, are listed for the SWW in the request in the ad hoc contract (see table above) however, these areas do not appear in the delegated act and data associated with these species in these areas are not considered to be required.

The ad hoc contract report also discusses the risk of inappropriate TAC adjustments associated with the catch composition approach which, in some sea areas, is used to define the fleet segments that will be subject to the landing obligation. Under these circumstances it is not possible to determine to which vessels the TAC adjustment would apply and hence it is not possible to advise on an appropriate TAC adjustment. In such cases, STECF considers there is a risk that fishing mortality could be inadvertently increased but also a risk that fishing opportunities could be unnecessarily constrained resulting in a lower fishing mortality than intended.

Given the lack of data regarding the proportion of vessels outside the landing obligation and a lack of discard data for those vessels, it is not possible for STECF to assess those risks. However, STECF notes that if a high proportion of fleets are subject to the landing obligation and there is little difference in discard rates between fleets in and out of the landing obligation, then the risk of increasing fishing mortality will be limited. The higher the proportion of vessels in a given fleet that are not subject to the landing obligation, and in the absence of discard data for that fleet, the higher the uncertainty associated with any estimate of risk of fishing mortality targets being exceeded.

Where catch composition rules apply in the delegated act definitions, then the submission of additional vessel based information is needed to determine the proportion of the fleet affected and therefore the appropriate discard quantity to apply in the TAC adjustment. There is currently a requirement for member states to submit this information at the start of the TAC year. In order to properly inform the TAC adjustment process by establishing which vessels will be subject to the landing obligation, this information needs to be submitted *before* the calculations are performed. This should also include information on the relative landings, effort and gear groupings (e.g. TR1; TR2 etc.) to which they belong.

In some cases mesh size information for gill and trammel nets was not available to the contractor and therefore it was not possible to determine mesh size specific discard data which is necessary to calculate the TAC adjustments for fleet segments defined by mesh size.

STECF notes that for a number of stocks ICES provides quantitative estimates of future catch including discards, in line with various management options and the final ICES advice generally corresponds with the objectives of a management plan or consistency with F_{MSY} . The forecast takes into account population dynamics including recruitment fluctuation and as such may better reflect likely discard quantities than estimates based on historical percentage discard rates.

STECF considers that combining the ICES estimated discard quantities with the information from the ad hoc contract on the relative contribution of fleets affected by the landing obligation (as set out in the delegated act) would be a pragmatic way of calculating an appropriate TAC adjustment.

The following examples illustrate how this could work:

Table 1

Worked example: Haddock in North Western Waters. Gear groups defined under the delegated act account for 99% of the catch and 100% of the discards. Scenario 1 gives the TAC adjustment when the landings obligation applies to all vessels within the fleets defined by the delegated act. Scenario 2 gives TAC adjustment assuming only TR1 (whitefish trawl) vessels are subject to the landings obligation. In each scenario the adjusted TAC includes a quantity representing landings of any vessels not defined under the delegated act. **Note the catch figures are arbitrary and are for illustrative purposes only.**

HAD IVb, VIa			
values extracted from Table 3 in ad hoc report			
Average			
	Landings	Discards	Catch
TR1	96%	21%	83%
TR2	3%	79%	17%
total catch (ICES forecast)	5000	*arbitrary value	
Discard rate (ICES forecast)	17%		
discards (ICES forecast)	860		
catch defined fleet	4950		
catch other fleets	50		
discard other fleets	0		
catch TR1	4108.5		
catch TR2	841.5		
discards TR1	180.6		
landings TR1	3927.9		
discards TR2	679.4		
landings TR2	162.1		
Scenario 1 all vessels affected			
adjustment	860		
landings defined fleets	4950		
landings TR1	4108.5		
discards TR1	0		
landings TR2	841.5		
discards TR2	0		
catch affected vessels	4950		
total catch	5000		
TAC	5000		
Scenario 2 TR1 vessels affected only			
adjustment	180.6		
landings defined fleets	4270.6		
landings TR1	4108.5		
discards TR1	0		
landings TR2	162.1		
discards TR2	679.4		
catch affected vessels	4950		
total catch	5000		
TAC	4320.6		

6. STECF CONCLUSIONS

STECF concludes that the ad hoc contract report (section 10 of the present report - Annex) could be used to inform the calculation of TAC adjustments. In particular, information on the contribution of different fleet segments to catches and discards of each stock affected by the landing obligation is summarised and tabulated (tables 3 to 5 of the ad hoc report).

STECF reiterates its earlier conclusions (STECF (2015b)) regarding the need to recognise the uncertainty associated with discard estimates in the STECF database.

STECF concludes there is only one stock, Northern prawn, affected by the first phase of the landing obligation for which no relevant information is available in the STECF database. STECF considers that ICES discard information could be used for this stock.

In order to be consistent with the ICES discard rates, STECF advises that the ICES forecasts of catch and discards should be used as a starting point for calculating TAC adjustments consistent with F_{MSY} principles. Fleet specific discard rates derived from the STECF database could then be used to determine fleet specific TAC adjustments.

STECF recommends that the experience gained in the first year of applying TAC adjustments is reviewed and that the suitability and robustness of any alternative candidate methods for these calculations are evaluated by STECF well ahead of next year's process.

STECF suggests that in regions where the delegated act has adopted catch composition rules to define vessels falling under the landing obligation (as opposed to gear and mesh size), member state lists of vessels and their characteristics are provided in advance of the evaluations mentioned above.

7. REFERENCES

STECF (2015a) Report 15-10 - Landing Obligation - Part 5 (demersal species for NWW, SWW and North Sea), (EWG 15-05)

STECF (2015b) Report 15-12 - Evaluation of Fisheries Dependent Information (EWG 15-08)

8. BACKGROUND DOCUMENTS

The declarations of STECF members, invited and JRC experts (see also section 4 of this report – List of participants) are published on the PLEN-15_03 meeting's web site on: <https://stecf.jrc.ec.europa.eu/plen1503>

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¹ - Information on STECF members and invited experts' affiliations is displayed for information only. In some instances the details given below for STECF members may differ from that provided in Commission COMMISSION DECISION of 27 October 2010 on the appointment of members of the STECF (2010/C 292/04) as some members' employment details may have changed or have been subject to organisational changes in their main place of employment. In any case, as outlined in Article 13 of the Commission Decision (2005/629/EU and 2010/74/EU) on STECF, Members of the STECF, invited experts, and JRC experts shall act independently of Member States or stakeholders. In the context of the STECF work, the committee members and other experts do not represent the institutions/bodies they are affiliated to in their daily jobs. STECF members and invited experts make declarations of commitment (yearly for STECF members) to act independently in the public interest of the European Union. STECF members and experts also declare at each meeting of the STECF and of its Expert Working Groups any specific interest which might be considered prejudicial to their independence in relation to specific items on the agenda. These declarations are displayed on the public meeting's website if experts explicitly authorized the JRC to do so in accordance with EU legislation on the protection of personnel data. For more information: <https://stecf.jrc.ec.europa.eu/adm-declarations> and <http://stecf.jrc.ec.europa.eu/web/stecf/about-stecf/cv> .

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10. ANNEX - REQUEST FOR SERVICES - AD HOC CONTRACT ON TAC ADJUSTMENTS

**Information to support decisions on TAC adjustments for
stocks subject to the landing obligation in 2016**
(Request for services - Ad hoc contract on TAC adjustments)

Authors: Ana Ribeiro Santos, Paul Dolder, Stuart Reeves, Tom Catchpole

**Issue date: 5th November 2015 (with updates of tables 4 and 7 done on 18th
November 2015)**

Executive Summary

Member States regional groups have identified fleet segments subject to the landing obligation (LO) as well as specific conditions under which a limited amount of discards may continue (i.e. de minimis). These fleet segments have been defined on the basis of catches of targeted species by certain fleets operating in different areas. The CFP allows for TAC adjustments to be made for those stocks under the landing obligation, recognising that fish that otherwise would have been discarded is now to be landed. These adjustments are to be made on the basis of the contribution by the fleets under the landing obligation to total catches and discards of the concerned stocks.

In the absence of definitive identification of fleet segments and vessels subject to the landing obligation in 2016, STECF is asked to identify the fleet segments concerned. This ad hoc contract contributes to the completion of this ToR in providing specifically requested information on (i) the contribution (%) of each fleet segment identified under the Member States' joint recommendations (Delegated Acts) to total catches and discards of the stocks/TACs and (ii) the discard rate of each fleet segment in relation to the same stocks/TACs.

Also, in the absence of discard information per fleet segment or partial fleet segment the STECF is requested to advise, for each of the concerned stocks, on the risk of increasing fishing mortality associated with using the average discard rate given by ICES for the entire stock as an approximation to calculate discards for the fleets under the landing obligation.

The output from this contract demonstrates that information from the STECF database can provide discard rate and catch contribution information for almost all of the stocks defined in the regional delegated acts related to 2016 for the North Western Waters, North Sea and South Western Waters. Where STECF data are absent and where fleet segments are defined in the delegated acts and catches of the affected species (Northern Prawn) are taken by those fleet segments, ICES average discard rate estimates can be applied to adjust TACs with minimum risk to increasing fishing mortality.

It is considered that the most significant risk in overestimating the discard rates and increasing fishing mortality through an adjusted TAC occurs where fleet segments are described by gear type and not mesh size, either in the fleet segment descriptions in the delegated acts or the STECF database. In these cases, precautionary adjustments could be considered.

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1 Introduction

1.1 ToR for the STECF on TAC adjustments

Member States regional groups have identified fleet segments subject to the landing obligation (LO) as well as specific conditions under which a limited amount of discards may continue (i.e. *de minimis*).¹ These fleet segments have been defined on the basis of catches of targeted species by certain fleets operating in different areas. The CFP allows for TAC adjustments to be made for those stocks under the landing obligation, recognising that fish that otherwise would have been discarded is now to be landed. These adjustments are to be made on the basis of the contribution by the fleets under the landing obligation to total catches and discards of the concerned stocks.

The task of this ToRs shall be carried out on the basis of the input from JRC. It should be noted that in the absence of definitive identification of fleet segments and vessels subject to LO in 2016 (through the lists of vessels that MS are required to prepare under the delegated acts of discard plans), STECF is asked to identify the fleet segments concerned on the basis of the annexes to the joint recommendations and other available data and knowledge. This ad hoc contract contributes to the completion of this ToR in providing specifically requested data:

1.2 Specific Request 1

The STECF is requested to provide information on (i) the contribution (%) of each fleet segment identified under the Member States' joint recommendations to total catches and discards of the stocks/TACs in table 1 and (ii) the discard rate of each fleet segment in relation to the same stocks/TACs in table 1. The referenced stocks in table differed from those defined in the delegated acts as published²: haddock area IV and Vb were in the in North Western Waters delegated act and so were included; area 'VI' was read as 'IV' in the published North Sea delegated act; and X and Union waters CECAF 34.1.1 are not referenced in the South Western Waters delegated act, however these have been presented as requested.

¹ Member States' Joint Recommendations.

² http://ec.europa.eu/fisheries/cfp/fishing_rules/discards/index_en.htm

Table 1.

North Western Waters	South Western Waters	North Sea
Whiting ICES Areas VII b,c,e-k	Hake VIIIc, IX and X; Union waters of CECAF 34.1.1	Saithe in ICES Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIId,	Common sole VIIla and VIIlb	Nephrops in Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIle	Hake VIIla, VIIlb, VIId and VIle	Common sole in Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIIb,c	Common sole VIIlc, VIId, VIle, IX (X and CECAF 34.1.1)	Northern prawn in Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIIf,g	Plaice VIII, IX (X and Union waters CECAF 34.1.1)	Plaice in Areas IV, IIIa and IIa (EU)
Sole ICES Ares VIIh-k		Hake in Areas IV, IIIa and IIa (EU)
Hake VII VI and VII and Union waters of Vb		Haddock in Area IIIa
Nephrops Area VII		Haddock in Area IV
Nephrops Area VI		Haddock in Area Vb
Haddock Area VIIa		
Haddock Ices Area Via and Union waters of Area Vb		
Whiting ICES Area VIId		

1.3 Specific Request 2

In the absence of discard information per fleet segment or partial fleet segment the STECF is requested to advise, for each of the concerned stocks, on the risk of increasing fishing mortality associated with using the average discard rate³ given by ICES for the entire stock as an approximation to calculate discards for the fleets under the landing obligation (as defined in the JRs).

For each stock where STECF identifies a high risk level associated with using the average discard rate, STECF is requested to advise on a precautionary rate to be used for the purpose of calculating TAC adjustments.

³ The rate of discards (unwanted catches) relative to total catches in ICES advice on catch options for 2016.

2 Data used

The following section provides an overview of data used in the analysis and a description of how the discard estimates were produced. Any issues of data quality to be considered when using these data are highlighted in the text, while a fuller description is included at Annex 6.2.

The main source of data used was the database compiled by the STECF Expert Working Group on the Evaluation of Fishing Effort Regimes in European Waters (STECF 15-12), using national data supplied by each Member State, under the DCF requirements. The STECF data are presented at the level of fishery (metier) but aggregated across categories submitted to JRC in some instances to reflect categories used in some EU effort management plans⁴. For brevity the data used in this analysis is hereafter referred to as the STECF database. The STECF database details landings and discards estimates for a range of fisheries, areas and species covering 2003-2014. The data used in this analysis was based on the average over the last two years (2013-2014) and for the stock/species in Table 1.

The STECF data are presented according with the fishing effort limits and associated conditions for the management of stocks (Council Regulation 41/2007):

- i) which are currently affected by fishing effort management schemes as defined in Annex II of the TAC and Quota Regulations (IIA, IIB and IIC);
- ii) in the Celtic Seas;
- iii) in the Biscay sole fishery;
- iv) in the Baltic Sea;
- v) in the Deep Sea and Western Waters regimes.

⁴ <https://datacollection.jrc.ec.europa.eu/dd/effort>

Table 1. Overview of the STECF areas included in the report.

Area	STECF ANNEX	STECF Areas	ICES management areas
Celtic Sea	Cel1	7bcefghjk	VII bcefghjk
Irish Sea	IIA	3c	VIIa
West Scotland	IIA	3d	VIa
Skagerrak	IIA	3b1	IIIaN
North Sea	IIA	3B2	IV and IIa EU
Eastern Channel	IIA	3b3	VIIId
Atlantic waters off the Iberian Peninsula	IIB	8C-9A	VIIIc and IXa
Western Channel	IIC	7E	VIIe
Bay of Biscay	BoB	8A-B	VIIIa and VIIIb
Deep Sea and Western Waters	WW	5 EU – 10 EU and non EU; CECAF 34.1	V – X and CECAF 34.1

The information on gear used and mesh size range is aggregated to provide discard estimates according to the fishery definitions under the different regulations:

Table 2. Fishery descriptions used in presentation of discard estimates

STECF Annex	Gear	Description
IIA, BoB, DS and WW	TR1	Bottom trawls and seines of mesh size ≥ 100 mm
	TR2	Bottom trawls and seines of mesh size ≥ 70 mm < 100 mm
	TR3	Bottom trawls and seines of mesh size ≥ 16 mm < 32 mm
	BT1	Beam trawls of mesh size ≥ 120 mm
	BT2	Beam trawls of mesh size ≥ 80 mm and <120 mm
	GN1	Gillnets, entangling nets
	GT1	Trammel nets
	LL1	Longlines
	Other gears (including pots, dredges, pelagic seines)	Gears not regulated under the cod plan.
IIB	3a	Otter trawls ≥ 32 mm
	3b	Gillnets, entangling nets ≥ 60 mm
	3c	Longlines
IIC	3a	Beam trawls ≥ 80 mm
	3b	Gillnets, entangling nets and trammel nets ≤ 219 mm

The report of STECF meeting 15-12 includes a Data Coverage Index (denoted DQI in tables) which has been provided as an indication of the level of discard sampling that has contributed to the discard estimate for a given species. It denotes the level that a species discard estimate that has been estimated from national sampling schemes (as opposed to those that have been ‘filled’ by discard estimates from other strata in the STECF raising procedure). The DQI is classified into three separate groups as follows:

A = 67 % or more of the landings have an accompanying discard estimate,

B = 34-66 % of the landings have an accompanying discard estimate, and

C = less the 33 % of the landings have an accompanying discard estimate (see section 6.2 for further details).

It should be noted that the DQI does not include information on strata not sampled by any Member State which are therefore not assigned any discard estimate and so may be an overestimate of the sampling coverage. Further it should not be interpreted as an overall indicator of the quality of the discard estimate (i.e. precision, confidence) because it takes no account of the level of sampling

coverage within a strata, which in some cases may be small. Such information is not available from the STECF database.

To support Specific Request 2, information on recent stock-level estimates of discard rates as used by ICES is given in an Annex along with information on the status of each stock in relation to MSY reference points.

3 Results

3.1 Results summary

The STECF database provided discard data and catch contributions for most of the fleet segments, species and area combinations subject to the landing obligations in the North Sea, North Western Waters and South Western Waters in 2016. For the discard rate data, the exceptions include Northern prawn (*Pandulus*) in the North Sea region, and Nephrops and sole in ICES area IIa. There is an ICES discard rate estimate for Northern Prawn for one stock in the North Sea region, but no discard estimates for the other stock areas. There are zero catches of Nephrops and sole in ICES IIa, therefore the absence of a discard rate is inconsequential. The other fleet segments for which there were no STECF data were plaice and sole in ICES X and CECAF 34.1.1 in the South Western Waters. There is no available catch data from STECF or ICES for these stocks, however these are not included in the final published delegated act.

Tables 3 to 5 detail the percentage contribution of each fleet segment to the total landings, discards and catch from the relevant TAC area in 2013 and 2014 (and the average of the two-years). The calculations are based on STECF data, and therefore exclude third countries (e.g. Norway in the North Sea). In some cases (e.g. sole in VIIb,c and f-k) the STECF data was not at an appropriate resolution to summarise the data precisely as specified in the fishery description, and in these cases the closest definition was used and an annotation made to highlight any differences. Tables 6 to 8 give discard rate data of the specific fleet segments defined in the delegated acts for each region in 2013 and 2014 (and the average of the two-years).

The format of the tables differs slightly between regions owing to the approach taken by the regional groups to define the fleet segments. In the North Sea, North Western Waters and South Western Waters regional discard plans, some of the stocks/species will be subject to the landing obligation based on the gear type and landings composition at a vessel level (saithe in the North Sea, hake in the South Western Waters; haddock, whiting, common sole and Norway lobster in the North Western Waters). Only those vessels using a specific gear type (e.g. otter trawl) that also meet a landing composition threshold will be subject to the landing obligation for specific species. It is not possible to determine a discard rate for this group of vessels, the STECF database presents data at a resolution that includes mesh size. The data presented relates to all vessels that could potentially be subject to the landing obligation. In these instances the actual coverage of a fleet (and its contribution to the catch of the fleet) should be taken into account when interpreting and using this information to calculate TACs. In

the North Sea region, all the fleet segment descriptions in the discard plan are consistent with the STECF database data format.

3.2 Table 3. The contribution (%) of each fleet segment identified under the Member States' joint recommendations to total catches and discards of the stocks/TACs for relevant stock in the North Western Waters region

Fisheries	Gear	Mesh Size	LO	ICES area	STECF Annex / Area	Gear	2013			2014			Average		
							Landings	Discards	Catch	Landings	Discards	Catch	Landings	Discards	Catch
Gadoids	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 10% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to haddock	Vb and VIa	IIa, 3D	TR1	97%	18%	82%	96%	24%	83%	96%	21%	83%
						TR2	3%	82%	18%	2%	76%	15%	3%	79%	17%
						Overall trawls	100%	100%	100%	98%	100%	99%	99%	100%	99%
Nephrops	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX, FPO, FIX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 30% of Norway lobster the LO shall apply to Norway lobster	Vb and VIa	IIa, 3D	POTS	12%	-	12%	11%	0%	11%	12%	0%	11%
						TR1	8%	-	8%	8%	0%	8%	8%	0%	8%
						TR2	80%	-	80%	80%	100%	82%	80%	100%	81%
						Overall trawls, seines and pots	100%	-	100%						
Hake	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 30% of hake, the LO shall apply to hake	VI, VII and Vb	Cel1, 7BCEFGHJK	TR1	13%	62%	26%	11%	34%	13%	12%	48%	19%
						TR2	2%	21%	7%	2%	37%	5%	2%	29%	6%
						TR3	0%	0%	0%	0%	0%	0%	0%	0%	0%
					IIa, 3B3 (VIId)	TR1	0%	0%	0%	0%	0%	0%	0%	0%	0%
						TR2	0%	0%	0%	0%	0%	0%	0%	0%	0%
					IIa, 3C (VIIa)	TR1	0%	0%	0%	0%	0%	0%	0%	0%	0%
						TR2	0%	0%	0%	0%	0%	0%	0%	0%	0%
					IIa, 3D (VIa+Vb)	TR1	8%	10%	8%	5%	21%	7%	6%	15%	7%
						TR2	0%	3%	1%	0%	1%	0%	0%	2%	0%
					Overall trawls	23%	96%	42%	18%	92%	25%	21%	94%	33%	
	All gillnets: GNS, GN, GND, GNC,	All catches of hake shall be	VI, VII and	Cel1, 7BCEFGHJK	GN1	22%	1%	17%	25%	3%	23%	23%	2%	20%	

	GTN		subject to the LO	Vb		GT1	0%	1%	0%	0%	1%	0%	0%	1%	0%	
			Ila, 3B3 (VIId)	GN1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
				GT1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
				Ila, 3C (VIIa)	GN1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
					GT1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Ila, 3D (VIa+Vb)		GN1	2%	0%	2%	2%	0%	2%	2%	0%	2%	2%	0%	2%	
Overall netters		25%	2%	19%	27%	4%	25%	26%	3%	22%						
	Longlines: LL, LLS, LLD, LX, LTL, LHP, LHM		All catches of hake shall be subject to the LO	VI, VII and Vb	Cel1, 7BCEFGHJK	LL1	39%	0%	29%	39%	0%	35%	39%	0%	32%	
					Ila, 3B3 (VIId)	LL1	0%	0%	0%	0%	0%	0%	0%	0%	0%	
					Ila, 3D (VIa+Vb)	LL1	12%	0%	9%	15%	0%	14%	14%	0%	11%	
					Overall longlines		51%	0%	38%	54%	0%	49%	52%	0%	43%	
Nephrops	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX, FPO, FIX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 30% of Norway lobster the LO shall apply to Norway lobster	VII	Cel1, 7BCEFGHJK	TR1	14%	16%	14%	18%	21%	18%	16%	19%	16%	
						TR2	28%	13%	25%	25%	17%	24%	26%	15%	25%	
						TR3	0%	0%	0%	-	-	-	0%	0%	0%	
						POTS	0%	0%	0%	0%	0%	0%	0%	0%	0%	
					Ila, 3B3 (VIId)	TR1	0%	0%	0%	0%	0%	0%	0%	0%	0%	
						TR2	0%	0%	0%	0%	0%	0%	0%	0%	0%	
					Ila, 3C (VIIa)	TR1	0%	1%	1%	0%	0%	0%	0%	0%	0%	
						TR2	55%	62%	57%	55%	62%	56%	55%	62%	56%	
						POTS	0%	0%	0%	0%	0%	0%	0%	0%	0%	
					Overall trawls, seines and pots		98%	92%	97%	98%	100%	98%	98%	96%	98%	
Gadoids	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS,	All	Where total landings per vessel of all species in 2013 and 2014	VIIa	Ila, 3C (VIIa)	TR1	40%	2%	18%	80%	2%	38%	60%	2%	28%	

	TB, SX, SV, OT,PT, TX		consist of more than 10% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to haddock			TR2	56%	94%	78%	18%	96%	60%	37%	95%	69%
						Overall trawls	96%	96%	96%	98%	98%	98%	97%	97%	97%
Common sole	All beam trawls (TBB)	All	All catches of common sole are subject to the LO	VIId	IIa, 3B3 (VIId)	BT1	0%	0%	0%	0%	0%	0%	0%	0%	0%
						BT2	31%	15%	27%	36%	26%	35%	34%	20%	31%
						Overall Beam	31%	15%	28%	37%	26%	35%	34%	20%	32%
	Trawls: OTB, OTT, TBS, TBN, TB, PTB, OT, PT, TX	<100mm	Where total landings per vessel of all species in 2013 and 2014 consist of more than 5% of common sole, LO shall apply to common sole .	VIId	IIa, 3B3 (VIId)	TR2	14%	78%	26%	12%	67%	18%	13%	72%	22%
						TR3	0%	0%	0%	0%	1%	0%	0%	0%	0%
						Overall trawls <100mm	14%	78%	26%	12%	67%	18%	13%	73%	22%
	All gillnets: GNS, GN, GND, GNC, GTN	All	All catches of common sole are subject to LO	VIId	IIa, 3B3 (VIId)	GN1	5%	0%	4%	5%	0%	5%	5%	0%	5%
						GT1	48%	6%	40%	44%	4%	39%	46%	5%	39%
						Overall netters	53%	7%	44%	49%	4%	44%	51%	5%	44%
Gadoids	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 25% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to whiting	VIId	IIa, 3B3 (VIId)	TR1	1%	1%	1%	0%	0%	0%	0%	0%	0%
						TR2	24%	50%	31%	18%	66%	42%	21%	58%	37%
						TR3	0%	0%	0%	0%	0%	0%	0%	0%	0%
						Demersal Seine	0%	0%	0%	0%	0%	0%	0%	0%	0%
						Overall trawls and seines	25%	51%	32%	18%	66%	42%	21%	58%	37%
Common Sole	All beam trawls (TBB)	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 10% of common sole, LO shall apply to	VIIe	IIc, 7E	3a (TBB>=80m m)	59%	5%	57%	53%	6%	47%	56%	5%	52%

			common sole.			BEAM	0%	0%	0%	0%	0%	0%	0%	0%	0%	
						Overall beam trawls	59%	5%	57%	53%	6%	47%	56%	5%	52%	
	All gillnets: GNS, GN, GND, GNC, GTN		All catches of common sole are subject to the LO	VIIe	IIc, 7E	3c (GN+GT)	11%	1%	11%	9%	0%	8%	10%	0%	9%	
Common Sole (Incl. VIIe)	All beam trawls (TBB)	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 5% of common sole, LO shall apply to common sole.	VIIb, c and f-k	Cel1, 7BCEFGHJK	BT1	0%	0%	0%	0%	0%	0%	0%	0%	0%	
						BT2	69%	32%	68%	68%	16%	64%	68%	24%	66%	
						Overall beam trawls	69%	32%	68%	68%	16%	64%	68%	24%	66%	
	All gillnets: GNS, GN, GND, GNC, GTN		All catches of common sole are subject to the LO	VIIb, c and f-k	Cel1, 7BCEFGHJK	GN1	3%	16%	3%	2%	0%	2%	2%	2%	8%	2%
						GT1	2%	0%	2%	2%	0%	2%	2%	0%	2%	
						Overall netters	5%	16%	5%	4%	0%	4%	5%	8%	5%	
Gadoids	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 25% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to whiting	VIIb, c, e and f-k	Cel1, 7BCEFGHJK	TR1	43%	21%	37%	48%	17%	32%	45%	19%	34%	
						TR2	27%	18%	25%	27%	12%	19%	27%	15%	22%	
						TR3	0%	0%	0%	0%	0%	0%	0%	0%	0%	
						Overall trawls	70%	39%	61%	75%	29%	51%	72%	34%	56%	

3.3 Table 4. The contribution (%) of each fleet segment identified under the Member States' joint recommendations to total catches and discards of the stocks/TACs for relevant stock in the North Sea region

Gear	Mesh size	ICES area	STECF Annex / Area	Gear	Stock/species	2013			2014			Mean contribution			
						Landings	Disc	Catch	Landings	Disc	Catch	Landings	Disc	Catch	
Trawls and Seines: OTB, OTT, OT, PTB, PT, TBN, TBS, OTM, PTM, TMS, TM, TX, SDN, SSC, SPR, TB, SX, SV	>100	IV	IIA, 3B2	TR1	Plaice	29%	6%	21%	30%	8%	21%	29%	7%	21%	
					Haddock	96%	94%	96%	97%	72%	94%	96%	83%	95%	
					Saithe ⁵	98%	100%	99%	93%	99%	99%	96%	99%	99%	
					Northern prawn	No Catches									
		IIIa	IIA, 3B1 & 3A	TR1	Plaice	69%	37%	62%	70%	56%	69%	70%	47%	66%	
					Haddock	58%	22%	55%	59%	31%	58%	59%	26%	56%	
					Saithe	51%	41%	51%	26%	13%	25%	39%	27%	38%	
Trawls and Seines: OTB, OTT, OT, PTB, PT, TBN, TBS, OTM, PTM, TMS, TM, TX, SDN, SSC, SPR, TB, SX, SV	70-99	IV	IIA, 3B2	TR2	Sole	2%	0%	1%	2%	1%	2%	2%	1%	1%	
	>100			TR1	Sole	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Overall trawls					Sole	2%	0%	1%	2%	1%	2%	2%	1%	2%
	80-99	IIa		TR2	Sole	No catches									
	70-99	IIIa	IIA, 3B1 & 3A	TR2	Sole ⁶	39%	60%	40%	47%	98%	50%	43%	79%	45%	
Trawls and Seines: OTB, OTT, OT, PTB, PT, TBN, TBS, OTM, PTM, TMS, TM, TX, SDN, SSC, SPR, TB, SX, SV	70-99	IV	IIA, 3B2	TR2	Northern prawn	No STECF data									
	32-69	IV	IIA, 3B2	OTTER	Northern prawn	90%	86%	89%	58%	100%	67%	74%	93%	82%	
	70-99	IV	IIA, 3B2	TR2	Nephrops	86%	96%	87%	76%	97%	77%	81%	96%	82%	
	>100	IV	IIA, 3B2	TR1	Nephrops	12%	4%	12%	23%	2%	22%	18%	3%	17%	
	Overall trawls					Nephrops	99%	100%	99%	99%	100%	99%	99%	100%	99%
	80-99	IIa		TR2	Nephrops	No catches									
	80-99	IIa		TR2	Northern prawn	No catches									
	70-99	IIIa	IIA, 3B1 & 3A	TR2	Nephrops	87%	97%	92%	88%	95%	90%	88%	96%	91%	

⁵ When targeting saithe: vessels are considered as saithe targeting if, when using trawls with mesh size > 100mm, they have had annual average landings of saithe of > 50% of all landings by the vessel taken in both EU and third country zone of the North Sea over the period of x-4 to x-2 where x is the year of application; i.e. 2012- 2014 for 2016 and 2013-2015 for 2017.

⁶ Except in ICES division IIIa when fishing with trawls with a mesh size of at least 90mm equipped with a top panel of at least 270mm mesh size (diamond mesh) or at least 140mm mesh size (square mesh) or 120mm square mesh panel placed 6 to 9 meters from the cod-end.

	70-99	IIIa	IIA, 3B1 & 3A	TR2	Haddock	34%	76%	37%	38%	68%	39%	36%	72%	38%
	70-99	IIIa	IIA, 3B1 & 3A	TR2	Northern prawn	0%	0%	0%	0%	0%	0%	0%	0%	0%
	32-69	IIIa	IIA, 3B1 & 3A	OTTER	Northern prawn	93%	100%	93%	95%	100%	96%	94%	100%	95%
Beam trawlers	>120	IV	IIA, 3B2	BT1	Plaice	12%	0%	8%	13%	0%	8%	13%	0%	8%
					Northern prawn	No catches								
Beam trawlers	80-119	IV	IIA, 3B2	BT2	Sole	85%	11%	42%	85%	88%	85%	85%	49%	64%
					Northern prawn	No catches								
Gillnets, trammel nets and entangling nets: GN, GNS, GND, GNC, GTN, GTR, GEN, GNF	All	IV	IIA, 3B2	GN1	Sole	7%	0%	3%	6%	0%	5%	6%	0%	4%
				GT1	Sole	5%	0%	2%	6%	1%	5%	5%	0%	4%
			Overall Netters		Sole	12%	0%	5%	12%	1%	10%	12%	0%	8%
			IIA, 3B2		Northern prawn	No STECF data								
Hooks and lines: LLS, LLD, LL, LTL, LX, LHP, LHM	IV	IIA, 3B2		LL1	Hake	6%	0%	4%	14%	0%	9%	10%	0%	7%
					Northern prawn	0%	0%	0%	0%	0%	0%	0%	0%	0%
Traps: FPO, FIX, FYK, FPN	IV	IIA, 3B2		POTS	Nephrops	1%	0%	1%	0%	0%	0%	1%	0%	0%
					Northern prawn	No STECF data								

3.4 Table 5. The contribution (%) of each fleet segment identified under the Member States' joint recommendations to total catches and discards of the stocks/TACs for relevant stock in the South Western Waters region

Fishery	Gear	Mesh size	LO	ICES area	STECF Annex/area	STECF gear	2013			2014			Average		
							Landings (t)	Discards (t)	Catch (t)	Landings (t)	Discards (t)	Catch (t)	Landings (t)	Discards (t)	Catch (t)
Common Sole	All bottom trawls: OTB, OTT, PTB, TBN, TBS, TB, OT, PT, TX	70-100mm	All catches of common sole are subject to the LO	VIIIa, b, d and e	BoB, 8A-B	OTTER	24.3%	73.0%	25.3%	28.9%	76.4%	31.3%	26.6%	74.7%	28%
	All beam trawls (TBB)	70-100			BoB, 8A-B	BEAM	8.6%	0.9%	8.4%	7.8%	6.3%	7.7%	8.2%	3.6%	8%
	All trammel and gill nets	>=100m			BoB, 8A-B	GILL	4.1%	0.1%	4.0%	1.5%	0.8%	1.5%	2.8%	0.5%	3%
						TRAMMEL	62.6%	26.0%	61.9%	61.0%	16.6%	58.8%	61.8%	21.3%	60%
			Overall netters		66.7%	26.1%	65.9%	62.6%	17.4%	60.3%	64.6%	21.7%	63%		
Hake	All bottom trawls: OTB, OTT, PTB, TBN, TBS, TB, OT, PT, TX	>=100	All catches of hake are subject to the LO		BoB, 8A-B	OTTER	21.4%	62.8%	28.0%	20.2%	51.6%	24.4%	20.8%	57.2%	26%
	All longlines : LL, LLS	All			BoB, 8A-B	LONGLINE	20.4%	5.7%	18.1%	19.5%	0.0%	16.9%	20.0%	2.9%	17%
	All trammel and gill nets	>=100m			BoB, 8A-B	GILL	49.9%	19.6%	45.1%	44.0%	13.1%	39.9%	47.0%	16.3%	42%
						TRAMMEL	1.1%	2.7%	1.3%	1.4%	3.8%	1.7%	1.2%	3.3%	2%
			Overall netters		51.0%	22.3%	46.4%	45.4%	16.9%	41.6%	48.2%	19.6%	44%		
Nephrops	All bottom trawls: OTB, OTT, PTB, TBN, TBS, TB, OT, PT, TX	>=70	All catches of Norway lobster are subject to the LO	BoB, 8A-B	OTTER	99.0%	100.0%	99.4%	99.7%	100.0%	99.8%	99.4%	100.0%	100%	
Nephrops	All bottom trawls: OTB, OTT, PTB, TBN, TBS, TB, OT, PT, TX	>=70	All catches of Norway lobster are subject to the LO	VIIIc and IXa	IIb, 8C-9A	3a (OTTER>=32mm)	90.8%	91.2%	90.8%	97.1%	-	97.1%	94.0%	91.2%	94%
Hake	Trawls and Seines: OTB, OTT, OT, PTB, PT, TBN, TBS, OTM, PTM, TMS, TM, TX,	>=70mm	Total hake landings in period 2013/2014 consist of: more than 10% of all landed species and more		IIb, 8C-9A	3a (OTTER>=32mm)	48.5%	98.9%	65.0%	50.7%	96.9%	62.9%	49.6%	97.9%	64%

	SDN, SSC, SPR, TB, SX, SV		than 10 metric tons.												
	All trammel and gill nets	80-99				3B (Gillnets >=60mm)	10.5%	0.0%	7.1%	16.0%	0.0%	11.8%	13.3%	0.0%	9%
						3T (Trammel nets)	6.6%	0.0%	4.5%	2.3%	0.0%	1.7%	4.5%	0.0%	3%
	Overall netters	17.1%	0.0%				18.4%	0.0%	13.5%	17.7%	0.0%	14%			
All longlines (LL, LLS)	Hook size > 3.85+/-1.15 length and 1.6 +/-0.4			3C (Longlines)	10.5%	0.0%	7.1%	16.0%	0.0%	11.8%	13.3%	0.0%	9%		
Common sole	All trammel and gill nets	>=100mm	All catches of Common sole are subject to the LO	IXa	WW, 9EU	GILL	2.4%	-	2.4%	3.6%	0.0%	3.6%	3.0%	0.0%	3%
						TRAMMEL	49.1%	-	49.1%	50.3%	0.0%	50.0%	49.7%	0.0%	50%
						Overall netters	51.4%	-	51.4%	54.0%	0.0%	53.6%	52.7%	0.0%	53%
Hake	Hake X and Union waters of CECAF 34.1.1		No info	X	WW, 10EU	BOTTOM TRAWLS	-	-	--	0.0%	0.0%	0.0%	0.0%	0.0%	0%
						GILL	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0%
						LONGLINE	-	-	-	0.0%	0.0%	0.0%	0.0%	0.0%	0%
				CECAF 34.1.1	WW, 34.1.1 EU	BOTTOM TRAWLS	0.0%	0.0%	0.0%	-	-	-	0.0%	0.0%	0%
						GILL	0.0%	0.0%	0.0%	-	-	-	0.0%	0.0%	0%
						LONGLINE	0.0%	0.0%	0.0%	-	-	-	0.0%	0.0%	0%
Common Sole	Common Sole X and Union waters of CECAF 34.1.1		No info	X	WW, 10 EU	no STECF Data									
				CECAF 34.1.1	WW, 34.1.1 EU	BOTTOM TRAWLS	-	-	-	0.0%	0.0%	0.0%	0.0%	0.0%	0%
Plaice	No info	No info	No Info	VIIIc and IXa	IIb, 8C-9A	3a (OTTER>=32mm)	0.0%	-	0.0%	0.0%	-	-	0.0%	-	0%
						3B (Gillnets >=60mm)	13.3%	-	13.3%	25.0%	-	-	19.2%	-	13%
						3T (Trammel nets)	31.1%	-	31.1%	50.0%	-	-	40.6%	-	31%
						Overall netters	44.4%	-	44.4%	75.0%	-	-	59.7%	-	44%
Plaice	No info	No info	No Info	X	WW, 10 EU	no STECF Data									

3.5 Table 6. Landings and discards (in tonnes) for the fisheries and species subject to the landing obligation in North Western Waters

Fisheries	Gear	Mesh Size	LO	ICES area	STECF Annex / Area	Gear	2013			2014			Mean DR	DQI	
							Landings	Discards	DR	Landings	Discards	DR			
Gadoids	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 10% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to haddock	Vb and Vla	IIa, 3D	TR1	4521.8	183.9	4%	3858.8	204.1	5%	4%	A,B,C	
						TR2	159.6	844.3	84%	95	661.6	87%	86%	A,B,C	
					Overall trawls	4681.6	1028.2	18%	3953.8	865.7	18%	18%			
Nephrops	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX, FPO, FIX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 30% of Norway lobster the LO shall apply to Norway lobster	Vb and Vla	IIa, 3D	POTS	1573.2	0	0%	1431.2	0	0%	0%		
						TR1	1041.5	0	0%	1057.9	0	0%	0%	C	
						TR2	10231.8	0	0%	10301.5	713.6	6%	3%	A,B	
					Overall trawls, seines and pots	12846.5	0	0%	12790.6	713.6	5%	3%			
Hake	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 30% of hake, the LO shall apply to hake	VI, VII and Vb	Cel1, 7BCEFGHJK	TR1	4993.4	7980.9	62%	5384.3	1719.6	24%	43%	B,C	
						TR2	736.7	2753.5	79%	1130.7	1872.6	62%	71%	B,C	
						TR3	0	2.3	100%	0.5	0	0%	50%	A	
					IIa, 3B3 (VIIId)	TR1	2.8	0	0%	0	0	0%	0%		
						TR2	0.5	0	0%	1.5	0	0%	0%		
					IIa, 3C (VIIa)	TR1	7.9	0.6	7%	6.2	0	0%	4%	A,B	
						TR2	54.5	3.3	6%	21.9	0.9	4%	5%	A	
					IIa, 3D (VIa+Vb)	TR1	2832.2	1309.4	32%	2719.6	1052.7	28%	30%	A,B,C	
	TR2	18.8	351.1	95%		12.9	66.6	84%	89%	A					
	Overall trawls	8646.8	12401.1	59%	9277.6	4712.4	34%	46%							
	All gillnets: GNS, GN, GND, GNC, GTN	All catches of hake shall be subject to the LO	VI, VII and Vb			Cel1, 7BCEFGHJK	GN1	8371	90.5	1%	12484.8	179	1%	1%	C
							GT1	45.1	159.8	78%	60.5	39.3	39%	59%	C
						IIa, 3B3 (VIIId)	GN1	3.2	0	0%	0.1	0	0%	0%	
GT1							0.1	0	0%	0.4	0	0%	0%		
IIa, 3C (VIIa)						GN1	0.5	0	0%	1.5	0	0%	0%		
						GT1	0.9	0	0%	0.1	0	0%	0%		
IIa, 3D (VIa+Vb)	GN1	855.3	0	0%	1105.2	0	0%	0%							
Overall netters	9276.1	250.3	3%	13652.6	218.3	2%	2%								
Longlines: LL, LLS, LLD,	All catches of hake shall be subject to the LO	VI, VII			Cel1,	LL1	14782.8	0	0	19499.4	0	0%	0%		

	LX, LTL, LHP, LHM			and Vb	7BCEFGHJK									
					Ila, 3B3 (VIIId)	LL1	1.1	0	0%	4.8	0	0%	0%	
					Ila, 3D (VIa+Vb)	LL1	4507.4	0.5	0%	7680.9	3.7	0%	0%	B
					Overall longlines		19291.3	0.5	0%	27185.1	3.7	0%	0%	
Nephrops	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX, FPO, FIX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 30% of Norway lobster the LO shall apply to Norway lobster	VII	Cel1, 7BCEFGHJK	TR1	2427.3	573.5	19%	3024.8	628	17%	18%	A
						TR2	4805.6	469.8	9%	4199.2	518.1	11%	10%	A
						TR3	1.5	0.2	12%	--	--	--	12%	A
						POTS	10.2	0	0%	5.2	0	0%	0%	
					Ila, 3B3 (VIIId)	TR1	0.5	0	0%	0	0	0%	0%	
						TR2	0.1	0	0%	0	0	0%	0%	
					Ila, 3C (VIIa)	TR1	85.2	21.4	20%	26.3	3.8	13%	16%	A,B
						TR2	9549.3	2207.2	19%	9362	1841	16%	18%	A,B,C
						POTS	12.6	0	0%	7.8	0	0%	0%	
					Overall trawls, seines and pots		16892.3	3272.1	16%	16625.3	2990.9	15%	16%	
Gadoids	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 10% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to haddock	VIIa	Ila, 3C (VIIa)	TR1	78.4	5.1	6%	384.4	9.4	2%	4%	A,B,C
						TR2	109.2	243.5	69%	84.2	543.2	87%	78%	A
						Overall trawls	187.6	248.6	57%	468.6	552.6	54%	56%	
Common sole	All beam trawls (TBB)	All	All catches of common sole are subject to the LO	VIIId	Ila, 3B3 (VIIId)	BT1	14.2	0	0%	3	0	0%	0%	
						BT2	1250.3	147.8	11%	1610.8	140.7	8%	9%	B
						Overall Beam	1264.5	147.8	10%	1613.8	140.7	8%	9%	
	Trawls: OTB, OTT, TBS, TBN, TB, PTB, OT, PT, TX	<100 mm	Where total landings per vessel of all species in 2013 and 2014 consist of more than 5% of common sole, LO shall apply to common sole .	VIIId	Ila, 3B3 (VIIId)	TR2	556.8	774.3	58%	541.1	365.3	40%	49%	A
						TR3	2.4	0	0%	4.5	3.1	41%	20%	A
						Overall trawls <100mm	559.2	774.3	58%	545.6	368.4	81%	70%	
	All gillnets: GNS, GN, GND, GNC, GTN	All	All catches of common sole are subject to LO	VIIId	Ila, 3B3 (VIIId)	GN1	208.9	4.7	2%	238.8	0	0%	1%	C
GT1						1949.2	63.3	3%	1928.5	22.7	1%	2%	A	
Overall netters						2158.1	68	3%	2167.3	22.7	1%	3%		

Gadoids	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 25% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to whiting	VIIId	IIa, 3B3 (VIIId)	TR1	118.4	40.7	26%	21.9	36.5	63%	44%	C
						TR2	3815.7	3054.6	44%	2900.7	11241.2	79%	62%	B,C
						TR3	0.8	0	0%	9.1	36	80%	40%	A
						Demersal Seine	0.5	0	0%	1.4	0	0%	0%	
						Overall trawls and seines	3935.4	3095.3	44%	2933.1	11313.7	80%	40%	
Common Sole	All beam trawls (TBB)	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 10% of common sole, LO shall apply to common sole .	VIIe	IIc, 7E	3a (TBB>=80mm)	472.8	1.7	0%	463.4	7.3	2%	1%	A,B
						BEAM	0.5	0	0%	1.1	0	0%	0%	
						Overall beam trawls	473.3	1.7	0%	464.5	7.3	2%	1%	
	All gillnets: GNS, GN, GND, GNC, GTN		All catches of common sole are subject to the LO	VIIe	IIc, 7E	3c (GN+GT)	90.3	0.2	0%	76.2	0	0%	0%	
Common Sole	All beam trawls (TBB)	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 5% of common sole, LO shall apply to common sole.	VIIb, c and f-k	Cel1, 7BCEFGHJK	BT1	1.5	0	0%	0.2	0	0%	0%	
						BT2	1456.7	26.6	2%	1474.9	27.4	2%	2%	A
						Overall beam trawls	1458.2	26.6	2%	1475.1	27.4	2%	2%	
	All gillnets: GNS, GN, GND, GNC, GTN		All catches of common sole are subject to the LO	VIIb, c and f-k	Cel1, 7BCEFGHJK	GN1	56.9	13.2	19%	39.1	0	0%	9%	C
						GT1	49.3	0	0%	53.6	0	0%	0%	
						Overall netters	106.2	13.2	19%	92.7	0	0%	9%	
Gadoids	Trawls and Seines: OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, TB, SX, SV, OT,PT, TX	All	Where total landings per vessel of all species in 2013 and 2014 consist of more than 25% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to whiting	VIIb, c, e and f-k	Cel1, 7BCEFGHJK	TR1	6699.1	1267.9	16%	7887.5	2877	27%	21%	B
						TR2	4253.6	1126	21%	4401.8	2066.2	32%	26%	B
						TR3	4.6	14.6	76%	0.4	0	0%	38%	C
						Overall trawls	10957.3	2408.5	97%	12289.7	4943.2	29%	63%	

3.6 Table 7. Landings and discards (in tonnes) for the fisheries and species subject to the landing obligation in North Sea

Gear	Mesh size	ICES area	STECF Annex / Area	Gear	Stock/species	2013			2014			Mean DR	DQI	Average ICES DR (2012-2014)	
						Landings (t)	Discards (t)	DR (%)	Landings (t)	Discards (t)	DR (%)				
Trawls and Seines: OTB, OTT, OT, PTB, PT, TBN, TBS, OTM, PTM, TMS, TM, TX, SDN, SSC, SPR, TB, SX, SV	>100	IV	IIA, 3B2	TR1	Plaice	22905.8	2237.4	9%	20232.3	3548.5	15%	12%	A,C		
					Haddock	34010.1	1906.4	5%	30427.4	2842.8	9%	7%	A,B		
					Saithe ⁷	34460.6	8562.7	20%	30870.5	9203.7	23%	21%	A,B		
					Northern prawn	No catches									14%
		IIIa	IIA, 3B1 & 3A	TR1	Plaice	4802.6	658.3	12%	6452.7	546.7	8%	9%	A		
					Haddock	1156.1	37.8	3%	1270.8	36.4	3%	3%	A,C		
					Saithe	1770.1	75.5	4%	446.0	18.8	4%	4%	A,B		
Trawls and Seines: OTB, OTT, OT, PTB, PT, TBN, TBS, OTM, PTM, TMS, TM, TX, SDN, SSC, SPR, TB, SX, SV	70-99	IV	IIA, 3B2	TR2	Sole	276.4	11.2	4%	271.5	16.8	6%	5%	A,B,C		
	>100			TR1	Sole	44	0	0%	31.7	3.6	10%	5%	A,B,C		
	Overall trawls					Sole	320.4	11.2	3%	303.2	20.4	6%	5%		
	80-99	IIa	--	TR2	Sole	No catches								No catches	
	70-99	IIIa	IIA, 3B1 & 3A	TR2	Sole ⁸	112.0	8.9	7%	133.8	24.3	15%	11%	A		
Trawls and Seines: OTB, OTT, OT, PTB, PT, TBN, TBS, OTM, PTM, TMS, TM, TX, SDN, SSC, SPR, TB, SX, SV	70-99	IV	IIA, 3B2	TR2	Northern prawn	No STECF data								14%	
	80-99	IV		TR2	Northern prawn	No STECF data									
	32-69	IV	IIA, 3B2	OTTER	Northern prawn	146.3	28.9	16%	152.9	68.9	31%	24%			
	70-99	IV	IIA, 3B2	TR2	<i>Nephrops</i>	9270.5	822.8	8%	10542.2	449.8	4%	6%	A,C		
	>100	IV	IIA, 3B2	TR1	<i>Nephrops</i>	1331.5	33.6	2%	3162	10.7	0%	1%	A,B,C		
	Overall trawls					<i>Nephrops</i>	10602	856.4	7%	13704.2	460.5	3%	5%		
	80-99	IIa	--	TR2	<i>Nephrops</i>	No Catches								No catches	
	80-99	IIa	--	TR2	Northern prawn	No STECF data								0%	
	70-99	IIIa	IIA, 3B1 & 3A	TR2	<i>Nephrops</i>	3318.1	3484.4	51%	3625.7	1751.9	33%	42%	A		
70-99	IIIa	IIA, 3B1 & 3A	TR2	Haddock	672	134.4	17%	806.4	80.6	9%	13%	A			

⁷ When targeting saithe: vessels are considered as saithe targeting if, when using trawls with mesh size > 100mm, they have had annual average landings of saithe of > 50% of all landings by the vessel taken in both EU and third country zone of the North Sea over the period of x-4 to x-2 where x is the year of application; i.e. 2012- 2014 for 2016 and 2013-2015 for 2017.

⁸ Except in ICES division IIIa when fishing with trawls with a mesh size of at least 90mm equipped with a top panel of at least 270mm mesh size (diamond mesh) or at least 140mm mesh size (square mesh) or 120mm square mesh panel placed 6 to 9 meters from the cod-end.

	70-99	IIIa	IIA, 3B1 & 3A	TR2	Northern prawn	1	0	0%	0.6	0	0%	0%	A	
	32-69	IIIa	IIA, 3B1 & 3A	OTTER	Northern prawn	2765.9	363.6	12%	3329	930.1	22%	17%	A	
Beam trawlers	>120	IV	IIA, 3B2	BT1	Plaice	9543.3	121.7	1%	9193.2	0	0%	1%	B	
					Northern prawn	No catches								No catches
Beam trawlers	80-119	IV	IIA, 3B2	BT2	Sole	11042.4	2035.3	16%	10401	1497	13%	14%	A	
					Northern prawn	No catches								No catches
Gillnets, trammel nets and entangling nets: GN, GNS, GND, GNC, GTN, GTR, GEN, GNF	All	IV	IIA, 3B2	GN1	Sole	943.8	0.2	0%	699.3	0.1	0%	0%		
				GT1	Sole	641.6	11.7	2%	726.8	10.5	1%	2%	A,C	
			Overall Netters		Sole	1585.4	11.9	1%	1426.1	10.6	1%	1%		
			IIA, 3B2		Northern prawn	No catches							No catches	
Hooks and lines: LLS, LLD, LL, LTL, LX, LHP, LHM	IV	IIA, 3B2	LL1	Hake	489.6	0	0%	1265.1	0	0%	0%			
				Northern prawn	0.1	0	0%							
Traps: FPO, FIX, FYK, FPN	IV	IIA, 3B2	POTS	<i>Nephrops</i>	85.8	0	0%	30.8	0	0%	0%			
				Northern prawn	No catches								No catches	

3.7 Table 8. Landings and discards (in tonnes) for the fisheries and species subject to the landing obligation in South Western Waters

Fishery	Gear	Mesh size	LO	ICES area	STECF Annex/area	STECF gear	2013			2014			Mean DR	DQI		
							Landings (t)	Discards (t)	DR (%)	Landings (t)	Discards (t)	DR (%)				
Common Sole	All bottom trawls: OTB, OTT, PTB, TBN, TBS, TB, OT, PT, TX	70-100mm	All catches of common sole are subject to the LO		BoB, 8A-B	OTTER	886	55.4	6%	1222.2	170.6	12%	9%	B,C		
	All beam trawls (TBB)	70-100					BoB, 8A-B	BEAM	312.1	0.7	0%	328.8	14	4%	2%	A
	All trammel and gill nets	>=100m					BoB, 8A-B	GILL	148.8	0.1	0%	65.1	1.8	3%	1%	C
								TRAMMEL	2285	19.7	1%	2580.1	37	1%	1%	C
								Overall netters	2433.8	19.8	1%	2645.2	38.8	1%	1%	
Hake	All bottom trawls: OTB, OTT, PTB, TBN, TBS, TB, OT, PT, TX	>=100	All catches of hake are subject to the LO	VIIIa, b, d and e	BoB, 8A-B	OTTER	3784.8	2094.3	36%	4577.6	1802.3	28%	32%	A,B,C		
	All longlines : LL, LLS	All					BoB, 8A-B	LONGLINE	3603.8	190	5%	4432.9	0.4	0%	3%	C
	All trammel and gill nets	>=100m					BoB, 8A-B	GILL	8819.5	652.6	7%	9982.9	457.9	4%	6%	B,C
								TRAMMEL	188.9	89.9	32%	322.9	133.4	29%	31%	B,C
								Overall netters	9008.4	742.5	8%	10305.8	591.3	5%	7%	
Nephrops	All bottom trawls: OTB, OTT, PTB, TBN, TBS, TB, OT, PT, TX	>=70	All catches of Norway lobster are subject to the LO		BoB, 8A-B	OTTER	1773	961.8	35%	2801.4	1563.5	36%	35%	A,B,C		
Nephrops	All bottom trawls: OTB, OTT, PTB, TBN, TBS, TB, OT, PT, TX	>=70	All catches of Norway lobster are subject to the LO		IIb, 8C-9A	3a (OTTER>=32mm)	176.2	3.1	2%	166.2	0	0%	1%	A		
Hake	Trawls and Seines: OTB, OTT, OT, PTB, PT, TBN, TBS, OTM, PTM, TMS, TM, TX, SDN, SSC, SPR, TB, SX, SV	>=70mm	Total hake landings in period 2013/2014 consist of: more than 10% of all landed species and more than 10 metric tons.	VIIIc and IXa	IIb, 8C-9A	3a (OTTER>=32mm)	4308.2	4259.4	50%	3930.2	2689.4	41%	45%	A		
Hake	All trammel and gill nets	80-99	Total hake landings in period 2013/2014 consist of: more than 10% of all landed species and more than	VIIIc and IXa	IIb, 8C-9A	3B (Gillnets >=60mm)	933	0	0%	1244.9	0	0%	0%			
						3T (Trammel nets)	589.4	0	0%	179	0	0%	0%			
						Overall netters	1522.4	0	0%	1423.9	0	0%	0%			

	All longlines (LL, LLS)	Hook size > 3.85+/-1.15 length and 1.6 +/-0.4	10 metric tons.			3C (Longlines)	933	0	0%	1244.9	0	0%	0%	
Common sole	All trammel and gill nets	>=100mm	All catches of Common sole are subject to the LO	IXa	WW, 9EU	GILL	7.5	0	0%	10.6	0	0%	0%	
						TRAMMEL	155.8	0	0%	147.2	0	0%	0%	
						Overall netters	163.3	0	0%	157.8	0	0%	0%	
Hake	Hake X and Union waters of CECAF 34.1.1	No info	No info	X	WW, 10EU	BOTTOM TRAWLS	--	--	--	0.6	0.3	33%	33%	
						GILL	0	0	0%	0.1	0	0%	0%	
						LONGLINE	--	--	--	1.8	0	0%	0%	
				CECAF 34.1.1	WW, 34.1.1 EU	BOTTOM TRAWLS	0	0	0%	--	--	--	0%	
						GILL	0	0	0%	--	--	--	0%	
						LONGLINE	0.1	0	0%	--	--	--	0%	
Common Sole	Common Sole X and Union waters of CECAF 34.1.1	No info	No info	X	WW, 10 EU	no STECF Data								
				CECAF 34.1.1	WW, 34.1.1 EU	BOTTOM TRAWLS	--	--	--	0.1	0	0%	0%	
Plaice	No info	No info	No Info	VIIIc and Ixa	IIb, 8C-9A	3a (OTTER>=32mm)	0	0	0%	0	0	0%	0%	
						3B (Gillnets >=60mm)	0.6	0	0%	0.5	0	0%	0%	
						3T (Trammel nets)	1.4	0	0%	1	0	0%	0%	
						Overall netters	2	0	0%	1.5	0	0%	0%	
Plaice	No info	No info	No Info	X	WW, 10 EU	no STECF Data								
				CECAF 34.1.1	WW, 34.1.1 EU	no STECF Data								

4 Data issues and interpretation

4.1 Landing composition approach

For the North Western Waters region, the fleet segment descriptions in the delegated act do not include mesh size, and instead the affected fleets are defined by gear type and catch composition. For example, where total landings per vessel of all species in 2013 and 2014 consist of more than 10% of the following gadoids: cod, haddock, whiting and saithe combined, the LO shall apply to haddock. This is not consistent with the format of the STECF data therefore the discard rates of the affected fleets cannot be determined exactly. Instead fleets using all mesh sizes (e.g. TR1 and TR2) are presented. Where the proportion of effort exerted by the different mesh sizes differs from the proportion exerted by the vessels subject to the landing obligation, the discard rate for this segment will differ from the average of the TR fleet. Therefore, there is a risk that the discard rate is set at a higher rate than that of the affected fleet segment.

In the example of haddock in Vb and VIa, the discard rate is high for TR2 (average 86%) and low for TR1 (4%), the average across both mesh sizes is 18%. It could be inferred that because most landings are taken by the TR1 fleet then most of the effected vessels, those that meet the catch composition threshold, will be using TR1 gear and therefore the corresponding discard rate should be based on the TR1 value. The average discard rate for the relevant stocks provided by ICES is 16.5% (ICES VIa) and 0% (ICES Vb). There are 10 instances of this issue within the North Western Waters delated act, two within the South Western Waters and one in the North Sea. We consider that overestimating the discard rates in these cases could increase fishing mortality through an adjusted TAC. Further analysis to determine the fleet composition that will be subject to the LO would be useful in these cases.

4.2 Defining mesh sizes for gill and trammel nets

The STECF database does not present mesh size for gill and trammel nets. Therefore, an overall discard rate for all mesh sizes is provided where gill and trammel net fleet segments will be subject to the landing obligation. This is an issue only when the regional discard plans include defined gill and trammel net mesh sizes to describe affected fleets. For example in the South Western Waters for common sole only when using gill and trammel nets =>100mm will vessel be subject to the LO. In these circumstances there is the potential for the discard rate associated with fleet segment subject to the landing obligation is different (higher or lower) from that of the overall rate. If the discard rate for the selected fleet segment is lower, and the overall rate is applied in an adjustment, then an increase in fishing mortality would result.

4.3 Southern Western Waters fleet segment mesh size

Similarly, the STECF database does not provide data at the resolution of mesh size for most of the South Western Waters fleet segments. All of the fleet descriptions from the SWW delegated act are defined by mesh size, but the STECF data provides information only at the level of gear type. Again, in these circumstances there is the potential for the discard rate associated with fleet segment subject to the landing obligation to be different (higher or lower) from that of the overall rate for the gear type. If the discard rate for the selected fleet segment is lower, and the overall rate is applied in an adjustment, then an increase in fishing mortality would result. There are four fleet segments where the average discard rate is above 30%, with all other less than 10%, a precautionary lower discard rate could be considered in these cases.

4.4 North Sea Northern Prawn and Nephrops and common sole in ICES IIa

The Northern Prawn in the North Sea is the only stock for which there are no STECF data but there are ICES data on discard rates and catches. Otter trawls take catches of Northern Prawn in ICES IV and IIa, the ICES discard estimate for these stocks is 14% (ICES IIIa + IVa East) and 0% (ICES I and II) respectively^{9,10}. It would be reasonable to apply these discard estimates as a TAC adjustment for otter trawl caught Northern Prawn as this gear type accounts for 100% of the catches. There are no catches of Nephrops or common sole in IIa therefore no TAC adjustment is required and an absence of data is inconsequential.

4.5 VIIe sole

In the STECF database common sole in ICES VIIe is presented in isolation, as well as combined with the wider area of ICES b-k (excluding d). The North Western Waters plan separates Common sole into ICES VIIe area and ICES VIIb,c,f-k. In Tables 3 and 6 the data are presented as extracted from the STECF database, and therefore show VIIe in isolation. However, catches of this stock are also included within the larger area. It would be possible to separate out VIIe from the larger area so that it matches exactly the delegated act area description. However, the % contribution to catch and discard rates for the two areas as presented by the STECF are comparable.

4.6 ICES stock status

⁹ ICES Advice on fishing opportunities, catch, and effort Barents Sea and Norwegian Sea Ecoregions Published 13 October 2015 ICES Advice 2015, Book 3 1; 3.3.9 Northern shrimp (*Pandalus borealis*) in Subareas I and II (Northeast Arctic)

¹⁰ ICES Advice on fishing opportunities, catch, and effort Greater North Sea Ecoregion Published 13 October 2015; ICES Advice 2015, Book 6 1; 6.3.17 Northern shrimp (*Pandalus borealis*) in Divisions IIIa and IVa East (Skagerrak, Northern North Sea in the Norwegian Deep)

To enable an assessment of risk associated with setting TAC adjustments the average discard rates derived from the ICES assessments are provided for all affected stocks in section 6.3. Tables 9-11 provide ICES stock status information and discard rates. It was considered that where stock status is considered poorer the impact of increasing fishing mortality through TAC adjustments could be higher.

5 Conclusions

Data from the STECF database can provide discard rate and catch contribution information for almost all of the stocks defined in the regional delegated acts related to 2016 for the North Western Waters, North Sea and South Western Waters. In the few exceptions where fleet segments are defined in the delegated acts and catches of the affected species (Northern Prawn) are taken by those fleet segments, ICES average discard rate estimates can be applied to adjust TACs with minimum risk to increasing fishing mortality.

Where the fleet segment descriptions in the delegated acts do not include mesh size, and instead the affected fleets are defined by a gear type and catch composition, there is a risk of overestimating the discard rates and increasing fishing mortality through an adjusted TAC. Where the proportion of effort exerted by the different mesh sizes differs from the proportion exerted by the vessels subject to the landing obligation, the discard rate for this segment will differ from the STECF average across all mesh sizes. There are ten instances of this potential issue within the North Western Waters delegated act, two within the South Western Waters (hake) and one in the North Sea (saithe). Applying the ICES average discard rate or a precautionary rate based on the affected fleet segment with the lowest rate could be considered in these instances or preferably conducting further analysis to determine the mesh size composition of the fleet segment that will be subject to the LO to more accurately estimate the discard rate.

Similarly, where fleet segment descriptions in the delegated act do contain mesh sizes and the highest resolution in the STECF data is to gear type (for the South Western Waters), there is a risk that the overall gear estimated rate is higher than the affected fleet segment and the adjusted TAC could increase fishing mortality. There are four fleet segments where the discard rate is sufficiently high to consider a precautionary lower discard rate, however, other than the ICES stock discard rate, there is no other information available on which to base this.

6 Annexes

6.1 *Generating discard estimates from the STECF database*

As the main source of discard estimates used was the STECF database, the following section briefly describes the process for developing discard estimates for that database. A detailed and extensive report on the data provided to the group and methods used by the group can be found in the report of the latest meeting (STECF, 2013).

National submissions – Member States are required to submit information annually to STECF according to a specified Data Collection Framework (DCF) data call using a data format which allows for analysis on landings, discard estimates and effort (measures in kw power x days-at-sea) disaggregated by Country, Year, Quarter, Vessel length category, Gear, Mesh size range, Fishery, Area and Special Condition (e.g. the use of a cod avoidance gear, if applicable). National submissions include information on landings and discard estimates provided according to national procedures which vary by country but are generally developed to provide the most precise estimates of discards possible with the level of observer coverage available.

Discard estimation procedure – The STECF expert group on fishing effort management regimes (STECF, 2013) has developed procedures for raising discard estimates for non-sampled national fisheries by utilising information provided by all EU Member States to the working group. The data aggregation and estimation procedures of the STECF effort group follow simple raising strategies and are generally considered consistent with the method used in the discard estimates published by the FAO (Kelleher, 2004). Fisheries specific discards and landings from each member state are used to replace poor or lacking values with aggregated information from other countries to get as complete a picture as possible of discarding in the various fisheries.

If a member state has not submitted discard information for a certain fishery in a certain area, the average discard ratio from other member states submitting discard information within the same fishery was used. Where no Member State has submitted a discard estimate for a particular metier segment and species, no discard estimate is provided (this is distinguished in the report from a zero discard estimate with the notation 'NA'= not available).

Let the following notation be: D=discards, L= landings, *snf* = sampled national fishery with a discard value from 0 to X, *unf* = un-sampled national fishery without a discard value. The available landings

and discards information were aggregated (summed) over fisheries to metier level (by species, year, quarter, regulated area, gear group and special condition). Mean discard ratios (DR) were calculated:

$$DR = \frac{\sum_{snf} D_{snf}}{\sum_{snf} (L_{snf} + D_{snf})} \quad \text{if } D_{snf} \geq 0 \text{ and with } L_{snf} + D_{snf} > 0$$

Fisheries specific discard amounts were then calculated if no discard information was available by

$$D_{unf} = \frac{L_{unf} \cdot DR}{(1 - DR)} \quad \text{where } D_{unf} \text{ is null (empty)}$$

If no country submitted discard information and no average DR could be estimated for a metier, it would remain without discard estimate.

6.2 STECF Data Quality

There are several steps involved in generating the fishery and species specific discard estimates produced by STECF and used within this report. The following section briefly outlines relevant factors that affect data quality. This includes a description of national sampling programmes/procedures, raising procedures and a discussion of the reasons for differences between ICES and STECF discard estimates.

National sampling programmes

Member States national laboratories collect biological information from fisheries at sea, including length distribution of the entire catch (retained fish and discards) according to criteria set out under the Data collection Framework (DCF). The framework includes targets per DCF level 6 strata (i.e. gear, mesh range, target species), with respect to minimum sampling effort (number of trips as a proportion of the overall trips by those strata) required to provide estimates with an associated precision. In the cases where a Member State (or a stratum?) does not have significant catches of a particular stock, no sampling of the fishery is required – and in many cases this means that no discard estimates are available for these fisheries.

Sending observers to sea is expensive and sampling coverage generally limited (0.5-1.5% per strata), and as a result confidence estimates around discard estimates are wide. In addition, there may be bias introduced by sampling skewed towards particular vessels or the presence of observers may also lead to changes in behaviour of the crew. All these practices and situations can lead to a potential bias which may affect the accuracy of any discard estimates.

Notwithstanding, such data provides the best estimates of discarding at sea currently available, and is utilised fully to provide estimates of total catch both for stock assessment purposes and to fulfil DCF data calls (such as the STECF data call).

National raising procedures for STECF DCF data call

The DCF data call to fulfil the requirements for the STECF expert group meeting on fishing effort management regimes requires submission of data at level which is much more disaggregated than national sampling schemes, according to the following criteria:

Criteria	Disaggregation
Country	3-letter country code
Year	2013
Quarter	1,2,3,4
Vessel length category	u10m, 10-15m or o15m
Gear	BEAM, DEM_SEINE, DREDGE, GILL, LONGLINE, NONE, OTTER, PEL_SEINE, PEL_TRAWL, POTS, TRAMMEL
Mesh size range	Specific to gear type, e.g. 70-79 mm
Fishery	e.g. DEEP for deep-sea fisheries
Area	e.g. (of relevance to NWW) 6a, 7a, 7b, 7cEU, 7e, 7f, 7g, 7h, 7jEU, 7kEU
Special Condition	e.g. FDF – fully documented fishery

Due to the highly disaggregated nature of the data, this can result in the provision of data with very few samples per strata or, in some cases, the same samples used across strata (e.g. across vessel length, special conditions etc.). The result of this is the potential for discard estimates which are the result of single samples, or only a small number of samples relative to the activity by the strata which can lead to discard estimates with wide confidence limits and low precision.

The design of a discard sampling scheme might differ depending on whether the objective was to estimate total discards, or discard for specific fleets. In the current context estimates from sampling schemes designed for the former purpose are being used for the latter purpose which again means the estimates should only be used with caution (STECF, 2013). Utilising the data at a level which it is not designed for may be the cause of some spurious discard estimates based on single samples, very low (or 0) landings being applied to raise the rest of the strata landings.

A substantial investigation into the quality of fisheries sampling programmes, data and associated analysis has been conducted by the ICES Planning Group on Commercial Catches, Discards and Biological Sampling (PGCCDBS), in their role to promote the ICES Quality Assurance Framework

(Nedreaas *et al.*, 2009), and by workshops and study groups established by PGCCDBS: WKPRECISE: (ICES 2009a) and WKACCU (ICES 2008a) on accuracy of sampling data; WKDRP (ICES 2007b) on discard raising procedures; WKMERGE (ICES 2010b), WKPICS (ICES 2011a, 2012c), SGPIDS (ICES 2011b, 2012a, 2013b) on design of commercial fishery sampling schemes and WKSMRF (ICES 2009b), WGRFS (ICES 2012b, 2013a) on recreational fishery surveys.

The main conclusion is that the present system of reporting data quality in DCF programmes is inappropriate. There is a lack of quality evaluation through a well-structured peer-review process supported by clear documentation of all components of the sampling programmes and the sampling outcomes. This type of review is a complex process that may be carried out in stages within Institutes and through external peer review, and requires appropriate experts in statistical survey design and practical implementation.

Data Coverage Index (DCI)

The report includes a Data Coverage Index which has been provided as an *indication* of the level coverage of discard estimates by species. It provides the percentage of landings by strata that have an associated discard estimate provided by Member States in comparison to those that do not have an associated discard estimation (though may be assigned one through the STECF raising procedure, or left without a discard estimate). The procedure for generating the DCI was as follows:

$$\left(\frac{\text{Quantity of landings per strata with an associated discard estimate as submitted by Member State}}{\text{Quantity of landings per strata without an associated discard estimate as submitted by Member State}} \right) * 100$$

It should be noted that it is not an indication of discard estimate quality (i.e. precision, confidence) which requires consideration of the number of trips of the strata sampled in relation to the overall effort: information not available for the STECF database.

STECF have noted that “While the DQI is a useful indicator of the proportion of landings by fishery by Member State and stock that are sampled for discards, it does not reflect the level of discarding each fishery carries out. Furthermore, the DQI does not distinguish between a fishery with a high discard rate and a fishery with a low discard rate, or the level of sampling allocated to each fishery. It’s an exploratory tool that allows the identification of the proportion of overall landings by fishery that was sampled.

In order to aid interpretation of the DQI, the DQI is further classified into three separate groups as follows:

A = 67 % or more of the landings have an accompanying discard estimate,

B = 34-66 % of the landings have an accompanying discard estimate, and

C = less the 33 % of the landings have an accompanying discard estimate.

STECF considers category A estimates to be sufficiently reliable to be used for assessment purposes, as the majority of the landings by species and fishery are accompanied with a discard estimate.

However it should be noted once again that this DQI cannot inform on the quality of the discard rate estimates supplied by nations (as affected for example by the proportion of fishing trips sampled for discards).

Category B discard estimates are considered to be less reliable than category A and require careful scrutiny before they are used for assessment purposes.

Category C discard estimates are the least reliable and STECF considers that they should not be used for assessment purposes.

6.3 ICES stock status and discard rate

Tables 9-11 contain information on the state of the stock and the discard rates used by ICES in recent forecasts for the relevant stocks in each of the three AC areas. The information is adapted from the 2015 ICES advice, except for a few minor Nephrops populations where 2014 is the most recent advice available. In most cases the discard rates given are averages across 2012-2014, which have either been taken directly from the ICES advice or calculated from annual estimates of landings and discards listed in the ICES advice. For the few cases where only 2014 advice is available, the discard estimates are based on the figures given in that advice. In some cases these are ten-year, rather than three-year means. Where discards are considered to be negligible, a figure of 0% is given. Where no information is available the discard rate is given as ‘?’.

For a small number of cases (Nephrops in VIId, all stocks in ICES subarea X) stocks feature in the discard plans but not in the ICES advice. These are listed as ‘N/A’. The state of each stock is given in ‘traffic lights’ relative to MSY reference points. Where no quantitative evaluation of stock status is available, the status is given as ‘?’.

For the areas and stocks considered here, there is often a mismatch between the species/area combination used in the regional recommendations and the biological stock unit used in the ICES advice. For this reason, the tables list both the AC combination (e.g. Haddock in VIa) and the corresponding ICES stock (in this case Haddock in IV, VIA and IIIa). At one extreme the stock unit for Northern Hake covers the entire area of both the North Sea and North-western Waters as well as part of the South-western waters area. In this case the ICES discard rate listed applies to the entire stock rather than any sub-section of it but more detailed, gear- and area-specific discard information is available from the STECF database. The other extreme is Nephrops, where ICES advice is based on Functional Units that represent the populations of limited sub-sections of the major areas. For instance, ICES advice covers ten different Functional Units within the North Sea. The state of stock (where available) and ICES discard rate is given for each of these units. In these cases, the ICES discard rate information is on finer spatial (but coarser gear) resolution than the STECF data.

6.4 Table 9 ICES Stock status and discard rate North Western waters

Species	area	ICES stock	State of stock		DR %
			FMSY	Btrigger	
Haddock	Vla	Haddock in IIIa, IV & VIa	○	○	10%
Nephrops	Vla	Nephrops in FU11, N. Minch	○	○	12%
		Nephrops in FU12, S. Minch	○	○	10%
		Nephrops in FU13, Clyde	○	○	21%
		Nephrops in VIa (other)	?	?	?
Hake	VI & VII	Northern Hake	○	○	14%
Nephrops	VIIa	Nephrops in FU14, Irish Sea E	○	○	13%
		Nephrops in FU15, Irish Sea W	○	○	25%
Nephrops	VIIId	N/A			
Nephrops	VIIb-k	Nephrops in FU16	○	?	0%
		Nephrops in FU17, Aran grounds	○	○	14%
		Nephrops in FU18	?	?	?
		Nephrops in FU19	○	?	49%
		Nephrops in FUs 20-21	?	?	45%
		Nephrops in FU22	○	?	21%
Haddock	VIIa	Haddock in VIIa	?	?	55%
Sole	VIIId	Sole in VIIId (Eastern Channel)	○	○	11%
Whiting	VIIId	Whiting in IV & VIIId	?	?	29%
Sole	VIIe	Sole in VIIe (Western Channel)	○	○	0%
Sole	VIIb-k	Sole in VIIb-c (W of Ireland)	?	?	0%
		Sole in VIIf-g (Bristol Channel)	○	○	2%
		Sole in VIIh-k (SW Ireland)	?	?	0%
Whiting	VIIb-k	Whiting VIIb-k	○	○	20%

6.5 Table 10 ICES Stock status and discard rate North Sea

Species	area	ICES stock	State of stock		DR %
			FMSY	Btrigger	
Plaice	IIIa	Plaice in IV & IIIa	○	○	40%
Haddock	IIIa	Haddock in IIIa, IV & VIa	○	○	10%
Saithe	IIIa	Saithe in IV, VI & IIIa	○	○	9%
Northern prawn	IIIa	Pandalus in IIIa and IVaE	○	○	14%
Sole	IIIa	Sole in IIIa & Western Baltic	○	○	4%
Nephrops	IIIa	Nephrops in IIIa	○	?	63%
Plaice	IV	Plaice in IV & IIIa	○	○	40%
Haddock	IV	Haddock in IIIa, IV & VIa	○	○	10%
Saithe	IV	Saithe in IV, VI & IIIa	○	○	9%
Northern prawn	IV	Pandalus in IVa (Fladen)	?	?	?
Sole	IV	Sole in IV	○	○	14%
Nephrops	IV	Nephrops in FU5 (Botney Gut)	?	?	10%
		Nephrops in FU6 (Farn Deep)	○	○	24%
		Nephrops in FU7 (Fladen Ground)	○	○	1%
		Nephrops in FU8 (Firth of Forth)	○	○	26%
		Nephrops in FU9 (Moray Firth)	○	○	10%
		Nephrops in FU10 (Noup)	?	?	3%
		Nephrops in FU32 (Norwegian Deep)	?	?	16%
		Nephrops in FU33 (Off Horns Reef)	?	?	?
		Nephrops in FU34 (Devil's Hole)	?	?	7%

6.6 Table 11 ICES Stock status and discard rate South Western waters

Species	area	ICES stock	State of stock		DR %
			FMSY	Btrigger	
Sole	VIIIa-e	Sole in VIIIa-b (Bay of Biscay)	○	○	0%
Sole	IXa	Sole in VIIc & IXa	?	?	0%
Sole	X	N/A			
Hake	VIIIa-e	Northern Hake	○	○	14%
Hake	VIIIc & IXa	Southern Hake	○	?	16%
Hake	X	N/A			
Nephrops	VIIIab	Nephrops in FUs 23-24	?	?	44%
Nephrops	VIIIc & IXa	Nephrops in VIIIc (FUs 25 & 31)	?	?	0%
		Nephrops in IXa (FUs 26-27)	?	?	0%
		Nephrops in IXa (FUs 28-29)	?	?	0%
		Nephrops in IXa (FU 30)	?	?	0%
Plaice	VIIIc & IXa	Plaice in VIII & IXa (Bay of Biscay)	?	?	?
Plaice	X	N/A			

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