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SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES – 48th PLENARY MEETING REPORT (PLEN-15-01)

PLENARY MEETING,
13-17April 2015, Brussels

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Abstract

The Scientific, Technical and Economic Committee for Fisheries hold its 48th plenary on 13-17 April in Brussels (Belgium). The terms of reference included both issues assessments of STECF Expert Working Group reports and additional requests submitted to the STECF by the Commission. Topics dealt with were inter alia assessments of Mediterranean stocks, technical measures, and multi-annual management plans.

TABLE OF CONTENTS

48th PLENARY MEETING REPORT OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (PLEN-15-01)

PLENARY MEETING

13-17 APRIL 2015, BRUSSELS

1. INTRODUCTION

The STECF plenary took place at the Centre Borschette, rue de Froissart, Belgium, from 13 to 17 April 2015. The Chairman of the STECF, Dr Norman Graham, opened the plenary session at 09:15h. The terms of reference for the meeting were reviewed and 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 17 April 2015.

2. LIST OF PARTICIPANTS

The meeting was attended by 26 members of the STECF and four JRC personnel. 13 Directorate General Maritime Affairs and Fisheries (DG MARE) and one DG Environment (DG ENV) personnel attended parts of the meeting. Section nine of this 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:
Massimiliano Cardinale
Andrew Kenny
Sakari Kuikka
Simon Jennings
Willy Vanhee

3. INFORMATION TO THE COMMITTEE

3.1. STECF plenary – information from the Commission – planning, new STECF, STECF data handling procedures

The STECF was informed that the summer 2015 plenary meeting will take place in Varese (Italy). The summer 2015 plenary meeting can be expected to be the last meeting in plenary of the current committee. The STECF was informed that the Commission selection board for the new STECF

finished its evaluation of applications and made a proposal to DG MARE management. Due to a very high number of high-quality applications the evaluation and selection was a rather difficult task. Applicants can expect to be informed in summer. The current committee will continue to be active until the new committee will meet in plenary the first time (November 2015).

The STECF was informed that the new data-handling procedures for STECF EWGs as agreed between DG MARE, STECF and JRC were presented by the JRC to the Committee for Fisheries and Aquaculture. Feedback received from Member States was generally positive.

4. ASSESSMENT OF STECF EWG REPORTS

4.1. STECF EWG-14-19 Mediterranean assessment part 2

Request to the STECF

STECF is requested to review the report of the STECF Expert Working Group meeting, evaluate the findings and make any appropriate comments and recommendations.

STECF observations

The meeting was held in Rome, Italy, from 19-23 January 2015. It was the second of the STECF expert meetings, within STECF's 2014 work programme, planned to undertake stock assessments of demersal/small pelagic species in the Mediterranean Sea. The meeting was chaired by Massimiliano Cardinale and attended by 20 experts in total, including 4 STECF members. Furthermore, two JRC experts and one DG MARE representative were present.

Historical fisheries and scientific surveys data were obtained from the official Mediterranean DCF data call issued to Member States on April 15th 2014 with deadline on 9th of June 2014. The data call also defined a second deadline on 12th January 2015 for the submission of trawl surveys data for Mediterranean Member States. The data call and its format are documented on the JRC's DCF website (http://datacollection.jrc.ec.europa.eu/data-calls). The timeline of upload has been in many cases well after the data call deadline and therefore the deadline was not respected by several MSs. Moreover, not all the requested data were provided by the MS; details can be found online in the following link

https://visualise.jrc.ec.europa.eu/t/dcf/views/medbs_coverage/Coverage?:embed=y&:display_count=no

as well as in the DCF Data Call Coverage Report for the Mediterranean and Black Sea in 2014 (JRC 2015).

In relation to each of the Terms of Reference (ToRs), STECF notes the following:

ToRs(1-2) Update and assess historic and recent stock parameter for a list of stocks and provide a synoptic overview for each stock: the EWG-14-19 analysed the data of 16 stocks. 9 out of 10 assessed stocks were classified as exploited unsustainably; the status of the remaining 6 stocks could not be defined due to data deficiencies or poor model fits (Table 4.1.1.).

ToR(3) Provide short and medium term forecasts of stock biomass and yield: the EWG-14-19 conducted short-term forecasts of stock size and catches for seven stocks. For three stocks it was not possible to carry out short-term forecasts due the use of a steady state approach in the assessment and to the high uncertainty evidenced by the retrospective analyses. Medium-term forecasts were not carried out due the lack of meaningful stock recruitment relationships (Table 4.1.1.).

ToR(4) Review the quality and completeness of all data: in fulfilment of TOR(4), stock-specific evaluation of the data quality were conducted for all stocks requested under TORs (1-3) by the EWG-14-19 experts. Moreover, the JRC team examined the data coverage and quality for the fisheries and survey data.

Issues in catch data of giant red shrimp and deep sea pink shrimp stocks of GSA 11 were evidenced. Such issues impeded to conduct an analytical stock assessment for these stocks. Issues with catch data of GSA 11 have been repeatedly highlighted by STECF in previous reports.

As in the past, France did not provide any fisheries data for GSA 8 (i.e. Corsica); moreover effort data for all French GSA's are absent prior to 2012.

Italy did not provide any catch data prior to 2004, no abundance-biomass data for small pelagics before 2008 and no MEDITS data for Italian GSA 17 prior to 2002.

As a result of not conducting DCF, Greece did not submit any data for 2009-2012 and submitted only last quarter of 2013.

Due to the very narrow time interval between data submission deadline and the meetings starting date, access to data was made available to the experts too late. As a result data deficiencies for certain stocks were not possible to be identified in due time before the meeting and this resulted in assessing less stocks than initially foreseen.

STECF supports the request of the EWG to anticipate future deadlines for data submissions by Member States, that should be set at least one month before the meeting so that access to the compiled data could be given to the experts one or two weeks before the meetings' starting date.

ToR(5) Update the proposed priority list for which stock assessment should be performed in each calendar year: in fulfilment of TOR (5), a document with the criteria defined for prioritising the stocks to be assessed between 2015 and 2017 have been produced. Also, a table with the list of the stocks proposed to be assessed in 2015, 2016 and 2017, based on the defined criteria, has been included in the report of the EWG.

ToR(6) Explore the possibilities to apply data-limited stock methods to assess the status of cephalopods: in fulfilment of TOR (6), a Multi-annual General Depletion Model was explored to produce a preliminary assessment of the cuttlefish *Sepia officinalis* in the Barcelona maritime district (comprising the ports of Arenys de Mar, Badalona, Barcelona and Vilanovai la Geltrú) in GSA 6. The model is able to satisfactorily fit the data and the diagnostics of the final model show that the catches (in number) can be reasonably predicted and that predictions are unbiased. The evolution of the vulnerable biomass of cuttlefish shows an increase in the last 10 years of the series, probably linked to a decrease in the fishing effort (and therefore fishing mortality) exerted by

bottom trawlers.

ToR(7) The EU has the intention to adopt a multiannual management plan for small pelagic species in the North Adriatic Sea. Discuss and propose the most scientifically sound MSY value or range of values and safeguard points, in terms of F and stock biomass: in fulfilment of TOR (7), EWG 14-19 estimated reference points (fishing mortality and biomass) for anchovy and sardine in GSA 17. Estimation of reference points was done based on the methodology recently used by ICES for North Sea and Baltic Sea stocks. The same procedure was applied to the same stocks during the EWG 12-19 and EWG 13-19. Several different scenarios with different values of B_{lim} and length of the time series were fitted to the latest stock assessment data (i.e. data up to 2013). The F_{MSY} values ranged from 0.057 to 0.198 for sardine and between 0.225 and 0.429 for anchovy, and were dictated by the choice of B_{lim} and the length of the time series used. However, EWG 14-19 did not reach consensus on which scenario should be used to define reference points (fishing mortality and biomass) for the stocks anchovy and sardine in GSA 17.

During the STECF Plenary 15-01, the experts revised the outcomes of the EWG-14-19 regarding TOR (7). The lack of an acceptable fitting for both stocks makes results uncertain and not useful. However, the range of F values derived from the analyses obtained under different assumptions appear to be in line with what shown by ICES (ICES 2014) for other species of small pelagics as sprat and herring in the North Sea and Baltic Sea.

The methodology developed by ICES to estimate F_{MSY} ranges (i.e. MSY package) allows mixing different stock-recruitment relationships for a single stock. This feature allows the analysis to take into account model uncertainty, which is more important when there is not a clear S/R emerging from the assessment results. The application of this methodology to the stocks of sardine and anchovy in the Adriatic Sea was explored by SGMED but neither Beverton and Holt model nor Ricker or a combination of the two models were able to fit the stock and recruitment observation for the two species, and thus an hockey-stick model was chosen. STECF Plenary 15-01 considers that the evaluation of biological risk (i.e. probability of SSB falling below B_{lim}) could be done using also other methods. STECF consider that by restricting the risk evaluation to the outcomes of the same runs that are used to estimate the F_{MSY} ranges, might underestimate risk by conditioning the analysis on the same levels of productivity. An MSE algorithm could be an alternative to MSY package in the future, integrating across several plausible scenarios to evaluate the robustness of the F_{MSY} ranges to uncertainty in stock dynamics and initial population status

STECF conclusions

Based on the findings in the EWG-14-19 report, STECF concludes the following:

Among the 16 demersal and small pelagic stocks analysed by the EWG-14-19, nine are currently being exploited at rates not consistent with achieving MSY (overfishing is occurring), one is sustainably exploited and 6 stocks were not assessed due to data deficiencies or poor model fits. A summary of stock status is given in Table 4.1.1.

Table 4.1.1.Summary of stock status for the 16 stocks analysed by the EWG-14-19, stocks for which current F is larger than F_{MSY} are highlighted in red.

Stock area	Species	Common name	Assessment	Comment	F	F_{MSY}	F/F_{MSY}	B/B_{lim}	Short term	Medium term
GSA 1	*Mullus barbatus*	Red mullet	XSA	Accepted	1.31	0.27	4.85		Yes	No
GSA 1	*Lophius budegassa*	Black-bellied anglerfish	VIT	Accepted	0.25	0.16	1.56		No	No
GSA 5	*Lophius budegassa*	Black-bellied anglerfish	XSA	Accepted	0.84	0.08	10.50		Yes	No
GSA 5	*Nephrops norvegicus*	Norwegian lobster	XSA	Accepted	0.29	0.17	1.71		No	No
GSA 6	*Sardina pilchardus*	Sardine	XSA	Accepted	1.94	0.56	3.46		Yes	No
GSA 6	*Engraulis encrasicolus*	Anchovy	ByoDim	Not accepted					No	No
GSA 6	*Lophius budegassa*	Black-bellied anglerfish	XSA	Accepted	0.91	0.14	6.50		Yes	No
GSA 7	*Engraulis encrasicolus*	Anchovy	XSA, ASPIC	Not accepted					No	No
GSA 7	*Sardina pilchardus*	Sardine	XSA	Not accepted					No	No
GSA 9	*Parapenaeus longirostris*	Deep sea pink shrimp	XSA	Accepted	0.69	0.71	0.97		Yes	No
GSA 9	*Sardina pilchardus*	Sardine	SepVPA	Accepted			> 1		No	No
GSA 11	*Aristaeomorpha foliacea*	Giant red shrimp		Not assessed					No	No
GSA 11	*Parapenaeus longirostris*	Deep sea pink shrimp		Not assessed					No	No
GSA 17	*Nephrops norvegicus*	Norwegian lobster		Not assessed					No	No
GSA 18	*Nephrops norvegicus*	Norwegian lobster	XSA	Accepted	0.85	0.14	6.07		Yes	No
GSA 18	*Mullus barbatus*	Red mullet	XSA	Accepted	0.48	0.45	1.07		Yes	No

STECF notes that stock-specific evaluations of the data quality were conducted for all stocks requested under ToR (1-3) by the EWG-14-19 experts and endorses the main findings. It is worth noting that still remain unsolved several issues linked to data quality. Such problems prevented the assessment of the status of some stocks due to unreliable data. Other causes that prevented analyses were linked to delays in data submission.

STECF considers that safeguard points for small pelagic in the Adriatic Sea, in terms of stock biomass that have been defined are too uncertain. The main advantage of the methodology developed by ICES to estimate F_{MSY} ranges is the possibility of mixing different stock-recruitment relationships for a single stock. This feature permits model uncertainty to be explicitly incorporated, which is more important when there is not a clear S/R emerging from the assessment results. This possibility was not exploited by the EWG-14-19. STECF considers that its application to the stocks of sardine and anchovy in the Adriatic Sea should explore that feature and not restrict the analysis to a hockey-stick model.

STECF concludes that the EWG-14-19 adequately addressed the Terms of Reference.

4.2. STECF EWG-15-01: Technical measures

Terms of Reference

STECF is requested to review the report of the STECF Expert Working Group meeting, evaluate the findings and make any appropriate comments and recommendations.

Background

The European Commission is carrying out a comprehensive revision of the current technical measures regulations in light of the new CFP which entered into force at the end of 2013. This revision will provide an opportunity to bring about a general improvement in the technical rules to facilitate the implementation of the landing obligation and to further the ecosystem-based approach, which are key objectives in the new CFP.

To support this revision, STECF EWGs 12-14 and 13-01 considered different principles for defining selectivity under the future technical measures regulation. These EWGs have considered the idea of moving from the current prescriptive and detailed technical-measures regulations towards a results-based approach. The results-based approach is considered preferable, because it would reduce the complexity of current technical measures legislation. It would harness the industry's potential for innovation to develop technology supporting the achievement of agreed aims. It is also in line with the principle of management by result included in the new CFP. The EU legislator fixes objectives, targets and standards, and Member States cooperate regionally with input from all stakeholders to design the best suited tools to achieve these objectives and targets.

Direct implementation of the results-based approach is impossible in the current technical measures regulations due to the absence of more precise objectives and targets of conservation to which the technical measures and means need to contribute. This introduces the need to move to the identification of appropriate metrics if a results-based approach is to be adopted. These by definition, need to be measurable and easy to comply with.

EWGs 12-14 and 13-01 considered several alternatives for a result-based approach: the concepts of catch metrics and of selectivity profiles (there may well be other approaches that could be used). These approaches have been further considered during the November plenary meeting of STECF (STECF 14-03) where some general principles and methodology for establishing such catch metrics or selectivity standards were established.

Terms of Reference of the EWG-15-01

In order to further developed these approaches it is proposed to hold an STECF EWG to define "example" catch metrics and selectivity standards for the main towed gear fisheries (principally demersal fisheries) in North Western, South Western and the North Sea (including the Skagerrak and Kattegat) based on current exploitation patterns and available catch data.
The EWG should take account of the findings from STECF-14-01 as well as the recent discussion issued by the Commission on this particular issue.

Request to the STECF

STECF is requested to review the report of the STECF Expert Working Group meeting, evaluate the findings and make any appropriate comments and recommendations.

STECF observations on the report

Result based management (RBM) is considered by the EWG to be a better management system than the current situation by focusing on the outcome instead of defining technical means to achieve it. A catch based approach negates the need for detailed gear prescriptions in TCM Regulations. EWG 15-01 reviewed what catch-based metrics could be used when moving from current TCM to RBM in order to evaluate the efficacy of "technical and/or tactical measures".

EWG 15-01 identifies two catch metrics categories (i) population dependent metrics (catch and CPUE @ age) which could provide comparisons between fleets but can not be used to assess trends in selectivity improvements over time and (ii) population independent (partial F/catchability) metrics which allow comparisons between metiers and between years. EWG 15-01 studied two

examples of the use of those catch metrics and their variability. A comparison of the variability across both population dependent metrics and population independent metrics shows that in one example provided (Celtic Sea haddock) both partial F and catchability indicators are more stable than population dependent metrics while in the other example (North Sea plaice) shows a low variability between metrics. Further stock-specific analysis is needed to assess the variability between metrics and determine the ability to detect changes in selectivity between and within fleets.

The landing obligation, when fully implemented is expected to provide incentives to fishermen to use technical and tactical approaches that will minimise the catches of unwanted fish. The period from the current situation to the full implementation of the landing obligation is called the "transitional period". Until the landing obligation has been fully implemented EWG 15-01 considers that some level of minimum selectivity standards should be used as "backstop measures" to ensure that no move toward less selective gears appear.

EWG identified the main elements affecting gear selectivity and considers the backstop measures should take into account only those factors. The main elements to be considered are cod-end and panel mesh size, twine thickness, panel position, cod-end circumference and lifting bag.

The expert group proposed 4 options to define those backstop measures. Option 1 would oblige individual fishermen to use mesh sizes that they have previously used based on their historic track records. Option 2 is linked with current gear and mesh sizes band effort levels, switching between mesh bands is permitted provided effort within bands remains constant. Option 3 link gears and mesh sizes to fishing opportunities; with more selective gear there individuals could have fishing opportunities for more species than with a less selective gear. Option 4 link gears and mesh sizes with spatial considerations; based on historic records with a specific gear category fishermen could have access to certain defined geographical areas. Each of those options has advantages and disadvantages which are precisely described in the report. EWG 15-01 considers that these 4 options could be used as a toolbox by the Commission to define the required backstop measures depending on the different fisheries characteristics.

Finally EWG-15-01 considered what MCRS should be based on. The report presents for main species a comparison between the current MLS, the length at 50% maturity and the selectivity of towed gears. The analysis shows that although the MLS matches closely with the mean length at maturity in most cases the towed gears studied catch substantial numbers of fish below the MLS. In addition the EWG notes that reducing MLS would lead to higher catches of juvenile fish. A clear conclusion is that MCRS should be based on biological species characteristics and not on current selectivity profiles.

STECF notes that the analysis of selectivity, minimum landing size, length at 50% maturation and optimal maturation length were focussed solely on demersal towed gears (OTB). STECF considers that a further analysis focussing the selectivity of static gears would be informative.

STECF notes that the basis for gear related technical measures for size selection in pelagic fisheries appears weak due to apparent high rates of post escape mortality. STECF considers that in light of this observation, that a more detailed review of the role of technical measures in pelagic fisheries be considered.

STECF conclusions

STECF concludes that the EWG 15-01 has appropriately addressed the TORs. STECF furthermore concludes that the report of the EWG 15-01 should form a basis for the Commission to proceed with the development for a proposal for a new regulation on technical measures and considers that the aim to avoid any decrease in fishing gear selectivity should be given high priority in order that the aim of achieving CFP objectives is enhanced.

STECF concludes that to reduce the risk of gears in use being less selective, rather than more selective following the neutralisation of the catch composition rules, regulators could consider adopting specified measures to prevent loss of selectivity of gear in use.

4.3. STECF EWG-15-02: Multiannual management plans (North Sea)

Background

Council Regulation (EU) No 1380/2013 on the new Common Fisheries Policy (CFP), has established new objectives and means for sustainable fisheries, including the objective of maintaining populations of harvested species above levels which can produce the maximum sustainable yield and achieving an exploitation rate consistent with this objective by 2015 and at the latest by 2020 for all stocks.

The CFP foresees the adoption of management measures in the context of multi-annual plans, which ensure transparency, predictability and stability within the process. While multi-annual plans were an option already in the CFP, after the 2013 reform they became a priority, according to Article 9 of Council Regulation (EU) No 1380/2013. The form and content of future multi-annual plans was subject to special analysis by a task force comprising the three main EU Institutions. The guidelines of this Task Force are in Council Document No 8529-14 PECHE 117 CODEC 1004.

Commission Proposal for a mixed fisheries multi-annual plan for the North Sea

Scope

The plan covers all demersal stocks caught entirely or partly in the Eastern Channel, North Sea, Skagerrak or Kattegat.

Objectives and targets:

a) To maintain stocks above the precautionary biomass.
b) For stocks for which ICES is able to provide advice on F_{MSY} ranges, to achieve a fishing mortality within those ranges by 2020 at the latest, and to maintain the mortalities within those ranges thereafter, taking into account technical interactions between fisheries.
c) For stocks for which ICES is unable to provide advice on F_{MSY} ranges, to achieve and maintain stocks at levels capable of producing catches which, according to scientific judgement based on considerations other than a full analytical assessment, are the highest among those that can be sustained in the long-term.
d) Ensure economic sustainability by managing under MSY to produce high and stable catches.
e) Contribute to the achievement of the objectives of the Marine Strategy Framework Directive.

Conservation measures

The Commission shall propose, each year, that total allowable catches are fixed for each of the species that are consistent with

a) Scientific advice on appropriate levels of fishing mortality for those stocks for which F_{MSY} advice is available.

b) Scientific advice on appropriate catches that might lead the stock to the objective b) above.

c) The avoidance of unwanted catches, taking into account scientific advice about mixed fisheries.

When allocating fishing opportunities to fishing operators, Member States shall ensure that choke effects can be avoided by the existing mechanisms (*inter alia*, *de minimis provisions*, inter-species quota flexibility, quota swaps).

Where appropriate the Member States will agree at regional level to establish fish stock recovery areas (Art. 8).

Safeguards

a) For any stock for which the spawning biomass is estimated to be below B_{pa}, conservation measures will be adopted that are consistent with rebuilding the stock to a spawning biomass greater than B_{pa} over a [n] year period.

b) For data limited stocks, conservation measures will be adopted to rebuild the stock whenever indicators (based on, *inter-alia*, catch, CPUE, surveys, recruitment indices) show that it is in a situation of low biomass and/or low reproductive capacity.

Technical measures

The Member States will agree at regional level on appropriate technical measures (Art. 7(2)) to contribute towards the achievement of the objectives of the plan, including:

a) Improving species-selectivity and/or size-selectivity in order to avoid unwanted catches.

b) Make obligatory or prohibit, as appropriate, the use of certain gear types after a certain percentage of the TAC has been taken.

c) Special measures to protect the prohibited species.

Review and updates

The performance of the plan in meeting its objectives will be assessed every [n] years.

Terms of reference

The STECF is requested to carry out quantitative analysis to support an impact assessment to assess the biological, economic and social consequences of implementing the various possible options described below, compared to fishing under Council Regulation (EU) No 1380/2013, including the landing obligation. It should also be assumed that the existing EU multi-annual plans for cod and for sole and plaice would no longer apply. STECF is requested to indicate the potential (dis)advantages, synergies and trade-offs of those options. STECF is also requested to compare the main options in terms of effectiveness, efficiency and coherence in achieving the objectives.

STECF should follow their guidelines for Impact Assessment reporting laid out in the STECF Protocols for Multi-annual Plan Impact Assessments (SG-MOS 10-01).

Detailed Request

STECF is requested to look at the following options:

a) What are the consequences of achieving, by 2016 and by 2020, fishing mortalities within the F_{MSY} ranges provided by ICES, with particular emphasis on the stocks of cod, haddock, whiting, saithe, sole, plaice and *Nephrops*?

b) In addition, for stocks that are below B_{pa}, what are the consequences for fishing opportunities in the mixed fisheries if the stocks are rebuilt to a spawning biomass greater than B_{pa} within i) 5 years or ii) 10 years (i.e. possible values of [n] in point 4 a)? (Considering that NS cod is near B_{lim}, the impact of this is likely to be driven largely at the rate at which you can recover cod).

c) Would by-catch stocks in the main fisheries be sufficiently protected through the management measures to achieve F_{MSY} on the species defining the fisheries (see point a), or would one or more need specific conservation measures? Can the stocks that are likely to need specific conservation measures be identified?

d) Based on the response to point c), what would be the advantages and disadvantages of grouping the by-catch stocks into an "other species" TAC? Are there any by-catch stocks for which individual TACs would be still recommended?

The management regimes in the intervening years between 2013 (the terminal data year) and 2016 (the first year of evaluation) should be taken to be as follows: 2014: agreed TACs; 2015: agreed TACs.

Indicators to be used in assessment of the North Sea multi-annual plan for comparison of defined options.

The STECF is asked to take into consideration the following indicators when commenting on the various questions 7(a) to (d) above:

Environmental:

1. Impacts on biodiversity
2. Abundance of main stocks
3. Evolution of the main predator and prey stocks

Economic by fleet segment and for SME:

1. GVA
2. Gross cash flow
3. Net profit
4. Profitability by fleet segment
5. Income by fleet segment
6. Supply to the market for each of the main species
7. Fuel consumption

Social

1. Employment by segment (differential impact between segments)

Governance

1. Expected monitoring and surveillance costs
2. Operator compliance (yes/no)

Possible impacts should be contrasted with the probable consequences of fishing the stocks according to the objectives laid out in Council Regulation (EU) No 1380/2013.

STECF is further invited to identify the most accurate indicators of progress (biological, economic, environmental and social) for this multi-annual plan.

STECF is asked to consider that one of the benefits it is anticipated this plan will achieve is to minimise any negative economic impacts of the landing obligation in the context of mixed-fisheries.

When the results from the above evaluations are available and the main advantages, synergies and trade-offs are considered, fisheries that would either be disproportionately affected, or could have significant effects on associated fisheries, should be mentioned. STECF is invited to suggest possible conservation measures (Art. 7) and / or incentives that could be introduced either in the multi-annual plan, or through delegation, to minimise the impact on those fisheries.

Request to STECF

STECF is requested to review the report of the STECF Expert Working Group meeting, evaluate the findings and make any appropriate comments and recommendations.

In making its review, STECF applied the TORs listed in the background section above

STECF observations

Preparatory discussions between STECF and DG MARE in Nov and Dec 2014 agreed a manageable programme of work and a mutual understanding of what could reasonably be delivered by a short EWG. Considerable preparation was carried out by the Chair of the EWG ahead of the meeting although it was clear that despite this effort, a growing list of additional requests meant that a complete analysis was unlikely to be achieved.

A Group of around 20 experts, observers and Commission officials met to complete the work and the EWG report outlines the approach and methods used to try to address the various questions. The basic approach was to compare the options with the baseline using simulations and employing four models, EwE, FCube, Simfish and Fishrent, to gain insights into different aspects of the plan. Values for the upper and lower ranges for F_{MSY} were provided by ICES. Annexes were provided with the EWG report describing in detail the different models used. To overcome issue created by not having a harvest control rule, an envelope approach was used (to simulate F_{low}/F_{upp}), and this essentially provided brackets to the potential results of the MAP.

STECF notes that an extensive analysis was carried out illustrated by a series of detailed figures comparing options with the baseline. The following table summarises the various management and fleet scenarios investigated.

Management scenario				**Fleet scenario**	
name	**runs**	**description**		**Lowest quota**	**Maximum economics**
CFP	cfp	Target:	F_{MSY}	ToR a)	
		Time to target:	2016		
CFP2020	cfp2020	Target:	F_{MSY}	ToR a)	
		Time to target:	2020		
MAP fast recovery	map.low	Target:	lower limit of F_{MSY} range	ToR a) and b)	
		Time to target:	2016		
		Safeguards:	B_{pa}		
		Recovery period:	5 years		
	map.upp	Target:	upper limit of F_{MSY} range		
		Time to target:	2016		
		Safeguards:	B_{pa}		
		Recovery period:	5 years		
MAP slow recovery	map10y.low	Target:	lower limit of F_{MSY} range	ToR b)	
		Time to target:	2016		

		Safeguards:	B_{pa}	
		Recovery period:	10 years	
	map10y.upp	Target:	upper limit of F_{MSY} range	
		Time to target:	2016	
		Safeguards:	B_{pa}	
		Recovery period:	10 years	

For a full detail description of the results it is necessary to consult the EWG report.

Some of the main findings from the modelling can be summarised as follows:

- In the short-term, differences between the performance of the CFP2020 scenario and the baseline are minor.
- If F is set at the upper limit of the F_{MSY} range, short-term catches are higher, but biomasses are lower and there is increased risk to B_{lim} for some stocks. More effort is required and there may be a negative impact on profitability. Setting F at the lower limit inverts these results.
- Observing the impact in a 2020 snapshot shows that fishing at the upper limit of the F_{MSY} range leads to increased risk to B_{lim} in cod and sole, there are larger landings for the fleets but these may be associated with higher costs.
- In the long-term, fishing at the higher limit of the F_{MSY} range generates higher catches but keeps biomasses lower and increases risks to the stocks. Effort has to be sustained at a higher level. In scenarios maximising revenues, fishing at the upper limit of the F_{MSY} range requires higher effort whereas at the lower limit revenues are smaller but so too is the effort required. The impact on profitability has not been possible to ascertain.
- In terms of employment not all fleets exhibit the same dependency on the species that drive the fisheries. Under 10m vessels have high employment but low dependency whereas large demersal vessels have high employment and high dependency. A few specialist fleets exhibit low employment but high dependency.
- The use of F_{MSY} ranges gives scope to reconcile TACs for different species so that they become closer to being consistent with F_{MSY}.
- The impact on most stocks of short (5 year) or long (10 year) recovery is not very pronounced except for cod where the risk is higher if recovery is protracted. In the short-term, impacts on the fleets are limited. On balance fast recovery for cod seems preferable.
- Bringing fishing levels closer to the lower limit of the F_{MSY} ranges could increase the influence of biological interactions in the system through natural mortality, partly driven by prey-predator interactions, playing a bigger part in influencing stock abundance. Conversely fishing at the upper limit of the F_{MSY} range initially generates higher catches but tends to suppress biomass and is only possible with increased effort and associated increased costs.

STECF considerations

STECF notes that the overarching reason for conducting these analyses was to provide guidance on whether the proposed MAP as set out in the background above represented an improvement on simply adopting the basic regulation. As such an important task for the EWG was to identify positive or negative aspects of the MAP which could inform decisions one way or the other.

Protocols for impact assessment of MAPs have in the past been discussed and agreed by (STECF 10-06a). In view of the recent developments, the contents of MAPs and the process to design a regulation proposal have changed, these protocols are outdated and require revision, although some of the elements are still relevant and should be kept.

STECF wishes to commend the EWG on the considerable effort and significant contribution made towards assessing the impact of the North Sea Multi-annual plan. The basic request to carry out an impact assessment using as a baseline the CFP regulation (Council Regulation (EU) No 1380/2013,) including the landing obligation was, from the outset, complex because of difficulties in interpreting the regulation and in modelling the landing obligation. STECF notes, that owing to time constraints, model limitations and considerable uncertainty in the future dynamics of biological, technical and economic systems arising from incoming management policies, a number of questions remain unanswered. The difficulties of the EWG were exacerbated by, the requirement for a fundamental change in the evaluation process, namely a shift away from evaluating candidate harvest control rules to the use of an 'envelope' approach comparing contrasted options with the baseline case (basic regulation). Belated updates of key inputs (F_{MSY} ranges values) also created difficulties.

STECF notes that the lack of harvest control rules is not simply a technical issue affecting the evaluation, rather there are implications for the future management of the fisheries. Experience over a number of years have shown that HCRs provide a mechanism to constrain large scale fluctuations in catch and confer the advantages of stabilisation and limiting the impacts of the uncertainties associated with the stock assessment process.

One of the principle elements of the outline North Sea MAP is the inclusion of F_{MSY} ranges for each species. The use of ranges represents a development beyond the basic CFP regulation which the EWG analysis was able to focus on. Recognising that it is not possible to simultaneously achieve single species F_{MSY} point estimates for all species in a mixed fishery, F_{MSY} ranges potentially provide a tool allowing for better reconciliation between fishing opportunities and the objectives of the CFP. Values for the F_{MSY} ranges were provided by ICES (Special Request advice March 2015), based on the general principle that the range should generate high yield (designed to deliver no more than a 5% reduction on MSY).

An important outcome from the EWG analysis is that the F_{MSY} range approach does appear to confer flexibility which could assist in reconciling difficulties arising in the mixed fishery context. STECF further notes that persistent fishing at upper limit of the F_{MSY} range across a range of stocks may not be precautionary and may have broader ecosystem impacts. For a mixed fishery as a whole, utilizing upper limit of the F_{MSY} range for a substantial proportion of the stocks may impair the economic performance of the fleet in the long-term. In order to avoid situations of this type developing, it will be important that decisions taken on fishing opportunities are carefully considered and rationally planned. Clearly, if the Council responded to annual advice by systematically agreeing TACs corresponding to upper limit of the F_{MSY} range, problems could quickly emerge. STECF draws attention to the fact that the ICES advice also includes important considerations as well as average long-term yield for fishing above or below F_{MSY}. In a single-species context fishing above F_{MSY} implies reduced stock biomass and this may be substantial where the upper limit of the F_{MSY} range (F_{upper}) is much higher than F_{MSY} So in utilizing F_{MSY} ranges there are more advantages to fishing between F_{MSY} and the lower limit of the F_{MSY} range

(Flower) than between F_{MSY} and F_{upper}".. STECF concludes that to maximise the likelihood of achieving the objectives of the CFP, setting fishing opportunities at the level of the upper limit of the F_{MSY} range should only be applied only in exceptional circumstances.

STECF notes that the advisory process will need to include a more explicit recognition of the multi-species and multi-gear nature of fisheries in the North Sea. Discussions in STECF EWGs dealing with the Landing Obligation (CFP Art. 15) have identified some technical or behavioural changes that might occur. These include adoption of novel gears, increased mesh size, greater flexibility in quota transfer and adjustments in areas fished. In addition to the difficulty of predicting what responses will take place, the lack of models which can adequately capture some of these dynamics limited the scope for analysis. Given the uncertainties, STECF cannot provide an exhaustive evaluation on what the impact of the landing obligation might be on the likely performance of the MAP, as compared with application of the basic regulation.

STECF notes that widespread introduction of technical measures leading to adjustments in exploitation pattern (eg. reduced catches of unwanted small fish) would result in changes to F_{MSY} and likely changes to the ranges. At this stage it is not clear at what pace such changes would take place if at all. Consequently, STECF considers it important that the MAP be subject to a revision three to five years after the implementation to take account of the impact that the LO may have on the coherence between the MAP provisions and the CFP objectives

The MAP as conceived focusses on a number of species that drive the fisheries, which generally occur in mixed fisheries containing varying proportions of other species, referred to as "by-catch" in the following text. To evaluate the question of whether management of the species that drive the fisheries adequately allows for the management of by-catch species, the EWG carried out an analysis of correlations between catches of driver species identified in the plan and a variety of by-catch species. The analysis suggested only limited correlation. In view of this, the STECF notes that it is unlikely that relying on the TAC of the driver species to manage other species will be effective, in accordance with CFP requirements. STECF however notes that when analysis was performed at the fleet level, there were more obvious correlations, suggesting some scope to use fleet related management measures for the driver species as a way of managing some of the bycatch species.

Based on the observations of the EWG, STECF notes that grouping a number of single species TACs into a combined TAC could introduce additional flexibility in the management of this system. However, there is an increase potential to overexploit some stocks by re-allocating catches within the mix, to species which may not be able to cope with such exploitation levels. The EWG identified a set of mitigation principles (e.g. not grouping species with very different market values) which STECF agrees need to be considered if combining single species TACs is finally included in a management plan. STECF concludes that an increase level of monitoring (e.g. collection of landings and discards information, survey indices, etc.) and enforcement activities would be essential to evaluate if any of the species in the combined TAC are being overfished. The EWG analysis also examined the efficacy of short or long recovery times. Owing to the status of the cod stock this became the main driver of many management decisions and the species effectively operates as a choke to achieving full potential of the fishery as a whole. STECF notes that short recovery times reduced potential choke effects quicker.

STECF notes that regional bodies will play a major role on the implementation of the MAPs, through the regionalization of some management measures. At the moment the extent to which the regional groups will be involved is unknown. One option might be for the Regional Group to

develop mixed fisheries recommendations based around a more balanced use of the MAP provisions taking due regard for long-term high yield and maintenance of stocks above the safeguards. Such an approach would require the Regional Group to have access to suitably tailored mixed fishery advice. STECF suggests that discussion between the Commission, Regional Groups, stakeholders and science providers is urgently needed to scope out requirements. This would ensure efficient use of sparse technical resources and build transparency into the process.

Finally, STECF draws attention to the need to consider the content of the MAP in the context of existing management of North Sea shared stocks through long-term management plans agreed with Norway. It is difficult to see how parallel arrangements could effectively operate without generating confusion to managers and stakeholders and placing unreasonable expectations on the science community. There is a need for dialogue in order to align the processes and build coherence.

STECF conclusions

STECF concludes from the EWG analysis that:

1. The F_{MSY} range approach appears to confer flexibility to setting fishing opportunities, which could help reconcile difficulties arising in a mixed fishery context, and the biomass safeguards adopted by ICES to advise on F_{MSY} ranges provide an important level of protection against over-fishing; therefore the NSMAP proposals represent an improvement on simply adopting the provisions of basic regulation.
2. There is an increased risk of over-exploitation if fishing opportunities are set in line with the upper limits of the F_{MSY} ranges, particularly if several stocks in a mixed fishery are involved.
3. The use of the F_{MSY} range approach should only be employed when informed by objective mixed fishery advice which demonstrates that attaining F_{msy} for the key driver species can not be achieved simultaneously and the the application of F_{msy} ranges are necessary to better reconcile mixed fisheries issues. In the absence of such information, then fishing opportunities should be set in accordance with single species F_{msy} advice.
4. For Mixed fisheries, relying on the TACs of the species that drive the fishery is unlikely to be effective at controlling the fishing mortality on other species caught in the same fisheries.
5. Grouping the fishing opportunities for a number of stocks into a combined TAC could introduce additional flexibility for vessel operators to manage their individual fishing opportunities. However, to do so, would mean that there is an increased potential to overexploit some of those stocks. This could occur if the cumulative TAC is used to target only a proportion of species included in the combined TAC thus catches of individual species could be significantly higher than would implied by their single species TAC. Such overexploitation could be particularly severe if large removals of species that are already over-exploited or have low productivity occurs (see section 5.6).

5. ADDITIONAL REQUESTS SUBMITTED TO THE STECF PLENARY BY THE COMMISSION

5.1. Request to STECF to review the NSAC advice document on the long-term management for *Nephrops* fisheries in the North Sea

Background

The North Sea Advisory Council has submitted an advice document outlining their views on the long-term management of North Sea *Nephrops*. The overall goal is to ensure that further development and improvement in the *Nephrops* fisheries can take place in a sustainable way, without affecting natural resources adversely. It states that fishing must be at a level that will allow *Nephrops* and other stocks to be maintained at levels that can achieve MSY, whilst ensuring an economically viable fishing industry.

This document has been developed by the stakeholders on their own initiative. It is unclear how the NSAC would expect such a stand-alone initiative to fit within the framework of a multi-annual plan, or into the implementation of the landing obligation or into the framework of regionalisation as envisaged under the CFP. However, there appear to be some elements in the NSAC document that could be of utility for the management of *Nephrops* fisheries within the multi-annual plan for the North Sea that is currently under development and DGMARE wishes to seek advice from STECF on these.

Terms of Reference

STECF is requested to:

1. Review the proposed NSAC advice document for compatibility with the objectives of Council Regulation (EU) No 1380/2013 (CFP).

2. In particular, assess and comment on whether the management measures proposed in the NSAC advice document are likely to deliver the CFP objectives.

3. Comment on the utility of managing *Nephrops* fisheries at the level of the Functional Unit and the utility of the proposed reference point B_{buffer} as a basis for providing advice on the management of North Sea *Nephrops* fisheries in the framework of a North Sea multi-annual plan.

STECF observations

STECF first notes that the proposal made by the North Sea Advisory Council (NSAC) for a long-term management plan (LTMP) for North Sea *Nephrops* is the result of a long process carried out in consultations with the fishing industry. The plan represents a positive development for the sustainable exploitation of North Sea *Nephrops* stocks which has been driven by the key stakeholders engaged in the fishery. STECF considers that such initiatives which involve the main stakeholders should be encouraged, as the resulting management framework is likely to have more chance to be accepted and implemented by the industry.

STECF notes that this process started before the 2013 reform of the Common Fisheries Policy (CFP), and therefore before the landing obligation included under Article 15 of the new CFP which obliged to land all catches for the stocks subject to catch limits (i.e. TAC and quota species). Furthermore, a multi-annual mixed-fishery management plan for the North Sea fisheries (NSMAP) is currently under development and the fisheries for *Nephrops* will most likely form an integral component of such a plan. The NSMAP is being devised with the intention to achieve the overall CFP objective of restoring and maintaining stocks in the North Sea at levels that will deliver maximum sustainable yield (MSY). STECF notes that, while several objectives of the NSAC initiative are common to both the North Sea mixed fishery plan and the landing obligation, it is still unclear if and how the NSAC *Nephrops* proposal could be linked or "integrated" into this process but it is clear that such link is required in order to avoid duplication of management measures, maintain stakeholder buy-in and guarantee consistency between the provision contained in each proposal.

STECF notes that the NSAC proposal contains a series of management measures which could potentially deliver some of the objectives of the Council Regulation (EU) No 1380/2013 (CFP). The core elements of the proposal can be summarised into several broad principles and measures as follows:

1. Management of the stocks at the level of the functional unit (FU), through Fishing Plans, tailored to each FU.
2. for each FU, set a target fishing mortality at a rate consistent with that producing the maximum sustainable yield,
3. set an overall North Sea TAC based on the summation of the catch advice across all FU's
4. for each FU, set a level of abundance B_{buffer}, below which target fishing mortality should be revised,
5. Implied in the Farne deeps example, where stock abundance is below B_{buffer} set an individual FU TAC through an "…of which no more than …" provision meaning that only a fixed proportion of the overall North Sea TAC can be taken in FU's which have abundances below the buffer value.

Regarding point 1 above (i.e., managing the stock at FU levels) STECF considers that this would potentially constitute an important step forwards in the management of fisheries for North Sea *Nephrops* stocks. STECF has, on many occasions in the past, highlighted the fact that in the North Sea, the present aggregated management approach (overall TAC for all FUs) runs the risk of unbalanced exploitation and that managing at the FU level could provide the controls to ensure that catch opportunities and effort are compatible and in line with the scale of the resources in each Functional Units. STECF and ICES have repeatedly advocated that North Sea *Nephrops* FUs should be managed separately (see for instance the review of scientific advice for 2015 – part 2, Luxembourg: Publications Office of the European Union, STECF 2014). STECF also notes that the setting of TACs (point 3 above) is the competence of the European Commission under article 43(3) of the Treaty if the Functioning of the EU (TFEU).

In the absence of measures that specify the out-take at an FU level and a general lack of detail in terms of the individual elements to be contained within the FU specific Fishing Plans, STECF is unable to determine whether theses would be consistent with maintaining fishing mortality rates consistent with F_{MSY} at a FU level.

Regarding the introduction of FU specific B_{buffer} reference points, STECF notes that the proposal aims to set these at levels above the current ICES MSY $B_{trigger}$, which is based on a B_{lim} proxy. STECF considers that such an approach is consistent with the precautionary approach as specified in the CFP (Article 2.2, Regulation (EU) 1380/2013).

STECF notes that the proposal outlines the type of measures that are intended to be used to manage the *Nephrops* fisheries in accordance with the objectives of the CFP. As described, the proposed measures state that their intention is to deliver CFP objectives. However, there is an absence of any specific detail on any of the measures listed. Hence it is not possible to assess whether the plan is likely to deliver the objectives of the CFP.

STECF conclusions

1. *Review the proposed NSAC advice document for compatibility with the objectives of Council Regulation (EU) No 1380/2013 (CFP).*

STECF concludes that the measures and instruments described in the LTMP for North Sea *Nephrops* fisheries proposed by the NSAC are worded such that the intention is to deliver the objectives of the CFP (Council Regulation (EU) No 1380/2013).

2. *In particular, assess and comment on whether the management measures proposed in the NSAC advice document are likely to deliver the CFP objectives.*

There is an absence of specific detail on how any of the measures listed will be implemented in practice. Hence, STECF concludes it is not possible to assess whether the plan is likely to deliver the objectives of the CFP.

3. *Comment on the utility of managing Nephrops fisheries at the level of the Functional Unit and the utility of the proposed reference point B_{buffer} as a basis for providing advice on the management of North Sea Nephrops fisheries in the framework of a North Sea multi-annual plan.*

STECF and ICES have repeatedly advocated that North Sea *Nephrops* FUs should be managed separately. STECF has no reason to change its advice and therefore concludes that in order to control the exploitation rate on individual *Nephrops* Functional Units, management measures need to be implemented at the functional unit level. STECF therefore considers that fishing opportunities consistent with exploitation rates that are intended to deliver stock-specific MSY should be set separately for each FU. As stated in the NSAC proposal, the intention to develop fishery plans for each functional unit would potentially provide a means to manage the exploitation rates on each FU, if appropriately devised and implemented. However, the plan also foresees an overall combined TAC for the North Sea based on the sum of the agreed catches over all FUs. In the absence of any detail as to how the individual functional unit fishery plans are to be implemented and the absence of measures that specify the out-take at a FU level which would be consistent with FU specific F_{MSY} catch advice there is no way to determine whether such plans will deliver the desired exploitation rates. Unless the fishery plans contain measures that will limit the exploitation rate on each FU to the desired (agreed) level, there remains the risk that an overall North Sea TAC for *Nephrops* will not control the exploitation rate on the different functional units.

Regarding the proposal to introduce the additional reference point B_{buffer} as a means to trigger enhanced management actions to limit the out-take at a FU level, STECF considers that the setting this value higher than the current MSY $B_{trigger}$ is in line with the precautionary approach.

5.2. Assessment of recreational fisheries for seabass

Background

STECF has previously provided an assessment of the seabass fisheries in the Atlantic and North Sea, in addition STECF are also preparing advice on recreational catches.

The Commission has already introduced a closure for fishing with OTM and PTM from February to April, in 2015 to reduce the mortality applied to the stock in the Celtic Sea, Channel, Irish Sea and North Sea.

In addition a 3 fish Bag limit for recreational fishermen has been introduced, and further proposals to limit catches by metier are under development. It is also expected to increase the MCRS to 42cm for all recreational and commercial fishermen.

Request to STECF

1. STECF is asked to determine the possible reduction in mortality that has resulted from the closure of the spawning areas and that might be expected from the introduction of the recreational bag limit in 2015.

STECF observations

According to scientific advice from the International Council for the Exploration of the Sea (ICES) sea bass (*Dicentrarchus labrax*) in the Celtic Sea, Channel, Irish Sea and southern North Sea (ICES divisions IVb,c and VIIa, d-h) suffers from a rapid decline in biomass, because of a combination of declining recruitment and increasing fishing mortality. The spawning stock biomass is declining towards the lowest historically observed level. The current fishing mortality is unsustainable and almost three times higher than F_{MSY}.

Thus, ICES advises on the basis of the MSY approach that total landings (commercial and recreational) should be no more than 1,155t; which would require a reduction in F of around 66% (ICES 2014).

Catches of seabass in ICES IVb, c & VIIa, d-h can be broadly split into three categories: (i) recreational; (ii) commercial fisheries targeting seabass, and; (iii) fisheries where seabass are taken as a commercial by-catch in mixed demersal fisheries. Based on 2010-2013 data, recreational fisheries account for 26% of the overall catch (commercial and recreational); commercial targeted fisheries account for 33% (mid-water pair trawls and lines) and other commercial fisheries where seabass are taken as by-catch account for 41% of the overall catch. The total recreational removals for areas IVb,c and VIIa,d-h are estimated around 1,400t – 1,600t compared with total reported commercial fishery landings of 4,200t on average during 2010-2013.

According to ICES (ICES 2014) and as reported in the sea bass report (Armstrong and Drogou, 2014 [report No. SI2.680348]), the largest contribution to the commercial landings for the North Sea, Channel, Celtic Sea and Irish Sea (ICES IVb, c & VIIa, d-h) stock is made by the targeted French and UK midwater pair trawls fishery. These take over 34% of the total commercial landings and are responsible for around 25% of the total (commercial and recreational combined) fishing mortality estimated by WGCSE 2014 for the years 2011 - 2013. This fishery targets mature fish aggregated to spawn on offshore areas in the western Channel during December to April. This is primarily a fishery involving around 30 French pair-trawlers, and smaller numbers of UK pair trawlers. Targeted fisheries on these spawning aggregations is conducted during that period and contributes significantly to the overall fishing mortality of the stock (25% of total catch) and especially to the reduction in numbers of adult fish that can successfully reproduce.

Thus, in order to protect the spawning component of the stock and to decrease the overall pressure in this seabass stock; the Commission implemented Regulation (EU) 2015/111 in January 26 which prohibits the fishing for for sea bass (*Dicentrarchus labrax*) in ICES divisions IVb,c, VIIa,d-k using pelagic trawls OTM — midwater otter trawls, PTM — midwater pair trawls) with a cod end mesh size of 70mm or greater from January 27th to 30th April.

STECF notes, that the OTM/PTM fishery is responsible of 25% of total catches. Assuming that (i) effort targeting seabass is not relocated to other areas where seabass are present and (ii) that there is no targeted fishing activity before January 27th and after April 30th that would result in catches of seabass, that a catch reduction of around 25% could be anticipated with a closure of ICES divisions IVb, c, VIIa, d-k between January 27th and April 30th. However; STECF is not in position to evaluate the possible reduction in mortality that has resulted from the closure of the spawning areas as the closure has not been finished at the time of STECF meeting and; thus; spatial catch and effort of the fleet affected are not available.

Moreover, with the intention of reducing the catches and fishing mortality of the recreational fishery; which account around of 26% of the total catches; the Commission adopted Council Regulation 2015/523 in 25th of March to amend Regulation 2015/104 on certain fishing opportunities including article 11a which stated that "*In recreational fisheries in ICES divisions IVb, IVc, VIIa, VIId, VIIe, VIIf, VIIg, VIIh, VIIj and VIIk not more than three specimens of sea bass may be retained per person per day*".

Document n° 686192 paper for STECF "assessment of recreational fishery for seabass" (Amstrong *et al*., 2015) investigated the potential effect in catches of increases in Minimum Landing Size (MLS) of seabass and/or different bag limits, using trip-level data from recreational fishery surveys carried out in recent years by France, the Netherlands and England. During the years of the recreational fishery surveys the MLS was 36cm and, thus, estimation presented in Amstrong *et al*. (2015) were carried out assuming a MLS of 36cm. Assuming full compliance, a 42cm MLS applied to the recreational fishery survey data would reduce the retained catch numbers by 39% in France, >23% in UK, and >64% in the Netherlands. However, it should be noted that MLS of 42cm was introduced in France and Netherlands in 2013 and 2014, respectively. Thus, STECF noted that with the combination of current country specific MLS and 3 fish bag limit, the expected maximum reduction of recreational fishery accomplished would be 39% for France (MLS= 42cm); 19% for UK (MLS= 36cm); and more than 64% for Netherland (MLS = 42cm). However, the contribution of the 3 fish bag limit alone to the overall reduction would be very limited (5% for France and 19% for UK) as the major contribution to the overall reduction is a change of MLS from 36cm to 42cm. Thus, STECF noted that the contribution to the potential reduction on catch numbers for the

implementation of 3 fish bag limit alone would be limited at a level of around 5% in France and 19% in UK (Table 5.2.1).

Table 5.2.1. Summary of % reduction in retained catch numbers for combination of MLS and bag limits applied to recreational survey data. Figures in bold are for MLS or bag limits on their own (from Amstrong *et al*., 2015).

MLS	Country	Bag limit					
		1	2	3	4	5	none
36cm	France	-	-	-	-	-	**4**
	UK	**52**	**32**	**19**	**12**	**8**	**5**
	Netherlands	**59**	**38**	**25**	**18**	**13**	**32**
42cm	France	61	46	39	36	35	**34**
	UK	>52	>32	>23	>23	>23	**23**
	Netherlands	>64	>64	>64	>64	>64	**64**
45cm	France	68	56	50	48	47	**47**
	UK	>52	>48	>48	>48	>48	**48**
	Netherlands	>74	>74	>74	>74	>74	**74**

Although the recreational catch estimations are highly uncertain; the recent estimates of total recreational removals of sea bass for France, the Netherlands, England and Belgium in Subareas IV and VII amount to 1,400t–1,600t compared with total reported commercial fishery landings of 4,200t on average during 2010-2013 (ICES 2014). By country, it was estimated that annual recreational catches for France for Area IV and VII were 940 t retained and 332 t released for the period 2009-2011 (more recent estimations are available but not separated by areas) (Herfautet *et al*.; 2010; ICES 2014); 138t for the Netherlands in Subarea IV in 2010-2011 (van der Hammen and de Graaf, 2012; ICES, 2012); 60t for Belgium in 2013; and between 230 – 400t for UK compared with total commercial landings of almost 900t in 2012 (Anon; 2014).

Assuming that the potential reduction in numbers presented in table Table 5.2.1 corresponds to potential reduction on catches; the potential reduction of recreational catches in weight would range between 510t and 542t (a reduction of about 35% of total recreational catches) provided that a 3 fish bag limit is fully implemented along with National management measures of MLS. Considering the 3 fish bag limit alone, the potential reduction in catches would be much lower between 90.7 and 123t.

As this regulation has entered into force on 25th March 2015 and given that (i) there is no information on recreational catches since the introduction of the measure and (ii) the estimation of recreational catches are highly uncertain; STECF cannot evaluate the reduction in mortality that has resulted from the introduction of the recreational bag limit in 2015.

STECF conclusion

STECF concluded that the expected maximum reduction of catches from both measures, assuming full compliance, no effort reallocation or no targeted fishery outside the seasonal closure, will be around 1,425t for commercial catches (25% of total catches) and 90.7 - 123 t (2% of total catch) for recreational fishery from a total annual average catch of around 5,696 corresponding to a total potential reduction of 27%.

Considering the full implementation of the 42cm MLS by France and the Netherlands, STECF estimates the potential catch reduction in recreational fishery would be increased up to between 510t and 542t (10% of total catch); which corresponds to a total potential reduction of around 2,000t (35% of total catches). STECF noted that ICES advice is to reduce catches by 66%. STECF notes that in to achieve such a reduction additional measures are required.

Request to STECF

2. In addition STCEF is asked to consider potential catch limits that could be imposed upon commercial fisheries by gear type. STECF is asked to determine a range of catch limits for each gear type, and the mortality reduction that would be achieved in 2015.

STECF observations

In 2012 and 2013 through expert meetings the Commission and Member States have been considering the introduction of a TAC for seabass. STECF noted that ICES has previously identified that a TAC may not be the most suitable means to effectively control mortality for this stock and has no basis for advising on the allocation of the advised landings to commercial and recreational fisheries.

STECF reiterates its advice given in 2014 (see STECF PLEN 14-02) as no new information is available to allocated potential catch limits by gear type:

STECF notes that stock definition and management area for sea bass by ICES is pragmatic and may not correctly identify the true stock structure. STECF also notes evidence from tagging for strong site fidelity in adult sea bass, resulting in many fish returning to the same coastal sites after spawning each year. Catch limits e.g. TAC or individual vessel limits, for the whole area could allow mobile fisheries to contribute to an increase in F in excess of F_{MSY} on any sub-stocks or localised populations. If catch limits such as TACs or individual vessel limits are to be considered as a means to manage fishing mortality on sea bass effectively, the resultant allocation of fishing opportunities would be complex and would need to be set at spatial scale which reflects the spatial structure of the various sub- populations which is currently poorly understood. In addition, STECF observes that the landings statistics from the commercial fishery are uncertain due to the likelihood of underreporting. Unreported removals are associated with the allowances under article 65(2) of the EU Control regulation 1224/2009, which permits disposal of up to 30kg of fish for personal consumption without supplying sales slips and article 14 (1&4), which exempts the mandatory recording in logbooks of catches of all species less than 50kg. For small-scale, low-volume fisheries catching sea bass, this legal missing catch could be significant except in countries such as France where log-book schemes require reporting of all landings in under-10m fleets (Armstrong and Drogou, 2014 [report No. SI2.680348]). The uncertainty in the landings statistics due to underreporting should be considered when decisions are made on which management measures and associated data-reporting requirements could potentially be applied to the fishery.

Moreover, STECF noted that around 25% of the recent landings in IVb,c and VIIa,d-h are recreational and the recreational catches are not known precisely, particularly at the national level.

Thus, STECF notes that a TAC limit for recreational fisheries by country will be difficult to adopt as any attempt to include recreational fishery catches or landings under a TAC system would be extremely difficult within Europe, even if the national allocations could be reliably determined. STECF notes that this is due to a lack of time-series of recreational catch data that would allow knowing the relative commercial and recreational catch contribution for allocation and, secondly, due to the difficulty and cost of the control, monitoring and enforcement of the TAC system for recreational fisheries.

Moreover, STECF notes that in the absence of explicit gear- and Member State-specific estimates of fishing mortality, the landings by Member State and gear group relative to the overall landings of seabass can be an appropriate proxy to estimate the contribution to the total mortality on sea bass. Based on the information presented in the sea bass report (Amstrong and Drogou, 2014), the approximate percentage contribution to the overall mortality by gear and Member State is given in Table 5.2.2.

Table 5.2.2. Average commercial and recreational landings of sea bass by country and gear group (where available) 2010 – 2013 and approximate contribution to overall mortality of sea bass.

Fishery	Landings	Percentage
UK(E&W) trawls	147	2.6
France trawls	793	14.0
UK(E&W) midwater	57	1.0
France midwater	1408	24.8
UK(E&W) nets	361	6.4
France Nets	139	2.5
UK(E&W) lines	175	3.1
France lines	305	5.4
UK(E&W) other	65	1.1
France other	142	2.5
Belgium	165	2.9
Netherlands	384	6.8
Channel Isles	54	1.0
recreational France 2009-11	940	16.6
recreational England 2012	335	5.9
recreationalNetherlands 2010-11	138	2.4
recreational Belgium 2013	60	1.1
TOTAL	5667	100

References

Anon 2014. Sea Angling 2012: a survey of sea angling activity and economic value in England. http://www.marinemanagement.org.uk/seaangling/.

Armstrong, M.J. and Drogou, M. 2014. Seabass fisheries in Europe and their management. Commission request for services SI2. 680348. 83pp.; presented also to STECF July 2014 plenary.

Armstrong, M.J., van der Hammen, T., and Gogg, R. 2015. Assessment of recreational fisheries for

seabass. Commission request for services – Sea Bass Commitment nº 686192. 36pp.

Herfaut J., Levrel H., Drogou M. and Véron G. 2010. Monitoring of recreational fishing of sea bass (Dicentrarchus labrax) in France: output from a dual methodology (telephone survey and diary) ICES CM 2010/R: 05.

ICES. 2012. Report of the Working Group on Recreational Fisheries Surveys (WGRFS). ICES CM 2012/ACOM:23. 55 pp.

ICES. 2014a. Report of the Working Group for the Celtic Seas Ecoregion (WGCSE), 13–22 May 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:12.

Van der Hammen, T and de Graaf, M. 2012. Recreational fishery in the Netherlands: demographics and catch estimates in marine and freshwater. IMARES Wageningen UR, Report Number C147/13.

5.3. Assessment of measures implemented by the Portuguese authorities in relation to the management of red seabream in ICES sub-area X.

Background

Red seabream is caught in hook-and-line, artisanal handline and longline fisheries off the Azores in ICES sub-division Xa_2. The fishery is regulated by EU legislation[1]. In addition, specific national and local management measures[2] have also been implemented establishing (i) a minimum landing size for red seabream, (ii) access conditions for fishing deep-sea species including red seabream, (iii) effort limitation and (iv) other technical measures.

Terms of Reference

The STECF is requested to advise on the conservation effects of the relevant national and local measures in place for the management of the red seabream fishery off the Azores, collectively and individually.

If not enough information is available to quantify the effect of measures, STECF is asked to identify the information that should be requested from Member States to allow for a quantitative evaluation to be made.

STECF response

The response provided below is built upon the information provided by Pinho and Herrera, (2015) to the STECF.

ICES provides advice on three different "stocks" for Red Seabream (*Pagellus bogaraveo*): a) areas VI, VII, and VIII; b) area IX, and c) area X (Azores region). STECF and Pinho and Herrera, (2015) note that the stock structure is uncertain and the areas represent appropriate management units.

1 Council Regulation (EU) No 1367/2014 of 15 December 2014 fixing for 2015 and 2016 the fishing opportunities for Union vessels for certain deep-sea fish stocks.

2 "Portaria n.° 1/2010 de 18 de Janeiro de 2010" and "Portaria n.° 50/2012 de 27 de Abril de 2012".

STECF notes that fleet exploiting stock in area X is composed by a small scale fishery with 89% of vessels classified as artisanal (open or close deck vessels length <12m), operating on coastal areas or nearby banks and seamounts, using mainly hand lines gears and large vessels (12-31 m) that operate mostly on offshore areas (between three to 200 nautical miles from the coast), using bottom longline gear. Red seabream can be considered an important component in multispecies fisheries in where catches of Wreckfish (*Polyprion americanus*), Bluemouth rockfish *(Helicolenus dactylopterus*), Greater forkbeard (*Phycis phycis*), Conger eel (*Conger conger*), and Alfonsinos (*Beryx splendens* and *Beryx decadactylus*) are also significant.

STECF notes that traditional ICES assessment methods, such as VPA (separable VPA, *ad hoc* tuning and XSA) have been used to assess Red seabream, but that they have not been validated or endorsed by ICES and that the stock is currently classified as category III under the ICES-Data Limited Stocks framework. The advice is based on one scientific longline survey abundance time-series, used as an indicator of stock size. STECF notes that landings and CPUE trends for the last five years suggest a significant decrease in stock abundance.

Pinho and Herrera (2015) present a catch curve analysis to estimate fishing mortality and a yield per recruit analysis to estimate biological reference points. Due to the lack of detail in their report on the values used for input to their analyses and the assumptions made, STECF is unable to verify whether the resulting estimates are reliable and robust to alternative assumptions.

STECF observes that in addition to EU Regulations, specific national and local management measures have been introduced to this fishery, including an increase in the minimum landing size (MLS) for Red seabream, specific access conditions to the deep sea fisheries, a spawning closed period, and individual quotas.

Pinhro and Herrara (2015) note that a new minimum landing size of 30cm for Red seabream was introduced in 2012 (Total Length, Fork Length of about 27cm). It is unclear whether this was the first time a MLS was introduced for this stock or whether it represents an increase on a previous MLS. Landings of fish <30cm in length are reported to be around 58 tons per year for the last five years (2009–2013) (50% less than the preceding period). While this management measure may have provided some protection for the immature fraction of the stock, in the absence of additional information, STECF is unable to discern whether the reduction in landings of juveniles was a consequence of improvements in selection in the fishery, due to increased discarding practices or a decline in recruitment.

Pinhro and Herrara (2015) note that the current MLS does not necessarily ensure an appropriate exploitation pattern with respect to the size of first maturity for females (ca. 40cm), and improving selection is likely to result in increases in biomass and improvements in yield. While an improved in exploitation pattern (increase in the size of first capture) would be beneficial to the stock, a further increase in the MLS could have a significant and negative impact on revenues in the short-term given that landings of individuals of fork length <32-35cm over the last four years accounted for about 50-76% of the total landings in weight.

Regarding the access conditions for deep-sea species, Pinhro and Herrara (2015) note that this regulation is primarily designed to protect the local (artisanal) fisheries, while trying to manage the traditional conflict between large- and small-scale fisheries. STECF notes that fishing effort of the hook and line fishery has increased over the last two decades and that this may have led to

increased spatial conflict between the two métiers. Furthermore, the introduction of area closures and restrictions on the longline fishery may offer protection to juvenile red seabream in coastal nursery areas through a reduction in fishing pressure by the longline fishery. This may also allow a greater proportion of the juvenile population (through reductions in fishing pressure in inshore areas) to migrate to offshore areas. There may also be other benefits to the coastal zone ecosystem due to reductions in longline effort. However, STECF notes that the longline effort may have been replaced to some extent by increased effort in the artisanal hand line fishery. While longline fishing may have a greater impact on the fish resources than the hand line fishery because more fishing effort is can be deployed across a broader area, In the absence of any time series of métier-specific, spatially explicit catch and effort (no. hooks deployed) data, the partial fishing mortalities between métiers cannot be estimated. Consequently, STECF is unable to assess the potential impact of any changes in fishing effort that have arisen as a result of the spatial restrictions on longline fishing.

Pinho and Herrera (2015) note that limiting or preventing longline vessels to selected coastal zones, meaning that in practice their effort has been redistributed to other areas that are already heavily exploited. The authors note that the cumulative effect of the areas closures effectively reduced the areas available to longliners by 40%. The redistribution of effort to offshore sea mounts is likely to have led to some localized depletion in these habitats and that given that there may be less connectivity between these offshore habitats, they may be vulnerable to overexploitation.

Regional authorities have introduced a temporal closure of the Red seabream fishery during the spawning peak period (January to March) to offer protection to spawning concentrations. STECF concludes that this is a positive measure given that outside the spawning season, spawners are much more difficult to catch because the fish are more dispersed and therefore are less vulnerable to fishing. However, STECF notes that this measure does not guarantee future higher recruitments and considers that fishing mortality should be controlled throughout the year in order to maintain an appropriate level of spawning stock biomass.

Since 2006, red seabream in ICES area X have been subject to a TAC and the national government has distributed fishing opportunities to individual Islands and vessels. STECF notes that while such a measure guarantees that all fleets receive a share of the TAC, since 2009 TACs have been set at levels above average landings and have therefore not been effective in constraining total catches.

STECF conclusions

STECF concludes that the absence of a reliable stock assessment and métier-specific spatial and temporal catch and effort data, precludes a quantitative assessment of the impacts of the measures introduced to manage the fishery exploiting red seabream in waters surrounding the Azores. Even if such data were available there is no guarantee that all of the measures could be evaluated quantitatively. Nevertheless, STECF notes that both catches and CPUE have been declining in recent years, implying that the fishable biomass of red seabream has also been declining, thereby suggesting that the current suite of measures, while potentially having delivered some positive conservation benefits, have not been sufficiently effective to prevent such a decline.

Pinho and Herrera (2015) provide extensive and useful insights into the dynamics of the fleets exploiting Red Seabream as well as quantitative analyses which explores the potential impacts of changes in fleet selection. In addition they present a useful and innovative qualitative analysis of each of the management measures. Given the general paucity of data and information currently

available, their analysis, which is primarily based on expert and opinion and local knowledge, is currently the best available information as to the efficacy of the individual measures. STECF concludes that their analyses are appropriate and that the conclusions drawn are supported by the information presented.

To undertake a more comprehensive quantitative analysis of the impact of the existing management measures for red seabream, a time series of fishery-dependent, métier-specific, spatial and temporal catch and effort data would need to be made available. STECF concludes that these finding be further considered by managers and in order to halt the apparent decline in the fishable biomass of red seabream, additional measures designed to improve the performance of the existing measures should be explored.

References

Pinho and Herrera, 2015. Assessment of the measures implemented by the Portuguese authorities in relation to the management of Red seabream. Report

5.4. Distribution of haddock fisheries in the North Sea and West of Scotland

Background

ICES, as a result of the 2014 benchmark, identified that stocks of haddock in the West of Scotland and the North Sea were biologically a single stock and consequently provided catch advice on this basis. However, in setting of fishing opportunities in 2015 the two quota were maintained with the advised TAC split between the areas.

A request for flexibility between the areas has been received allowing for a Member State to catch an agreed percentage of one quota allocation for a particular area in another quota allocation area. In this instance the request is to fish part of the North Sea allocation in the West of Scotland. For example a vessel having, haddock quota in area IV, and saithe quota in area VI. When the vessel fishes in area VI, it is discarding haddock, while in area IV the opposite happens.

The Commission prefers that certain criteria are met for such flexibility to be exercised; it should be one stock; MS have access to other quotas in that area; and that all Member States with allocations in the two impacted areas are in agreement. In the case of haddock in areas IV and VI there is an additional concern; the potential impact on the stock of cod in the West of Scotland. Stocks of cod in the North Sea and West of Scotland are separate stocks. ICES identify the West of Scotland (VIa) stock to be highly depleted and the advice remains for no directed fisheries and minimisation of by catches.

Request to the STECF

Consider the advantages and disadvantages of introducing inter-area flexibility into the haddock TAC and in particular the likely impacts on the cod stock in ICES Area VIa.

Identify the level of inter-area flexibility that might be applied in further management of the haddock stock(s) across the two areas, which would not risk increasing fishing mortality on the stock of cod in VIa to such an extent as so creating a risk for their recovery

Review earlier advice on cod avoidance, identifying any areas of spatial or temporal separation in the cod and haddock distributions.

STECF observations

STECF notes that vessels engaged in mixed-demersal fishing in VIa exploit a variety of species including haddock, but typically take significant catches of cod despite the recent zero TACs. For example, in 2013 the TR1 fleet caught 1,128t of cod (ICES, 2014) representing 75% of the total cod catch in VIa. STECF notes that total cod catches in 2013 (1,501t) were almost 15 times higher than catches consistent with the ICES MSY approach (103 t). STECF notes that the TAC for cod in the West of Scotland has been zero since 2012 and the stock is considered to be highly depleted; therefore, in order not to further jeopardize the stock's recovery, any increase in cod catches must be avoided. STECF also stresses that the cod recovery plan measures (including Article 13) have not been effective at delivering reductions in fishing mortality; on the contrary, partial fishing mortality rates on cod by the main fleet segments using Article-13 derogations have increased (STECF-PLEN-14-03) and total fishing mortality on cod has not been reduced.

Based on additional information from the European Commission focal point, STECF notes that the basis for this particular request is to permit flexibility to mitigate against over-quota discarding of haddock in the mixed demersal TR1 fishery in ICES Division VIa by permitting some transfer of haddock quota from the North Sea, which ICES considers to be part of the same stock. STECF views that quota flexibility, where appropriate, is likely to offer a useful mechanism to avoid or mitigate choke scenarios following the full introduction of the landings obligation. STECF notes that the discarding of haddock in VIa is primarily attributable to the TR2 *Nephrops* fleet (due to poor selectivity) which accounts for 83% of the 1,020t of haddock discards (STECF Effort Database). Haddock discards in the TR1 mixed demersal fishery are typically <10% of the total catch of haddock (recent average of 196t/year).

STECF notes that the agreed TAC for haddock for 2015 for the North Sea is 40,711t while that for West of Scotland is 4,536t. This implies that if, for example, 10% of the North Sea TAC is transferred to the West of Scotland, the West of Scotland TAC would almost be doubled (from 4,536t to 8,607t). It seems plausible therefore, that if 10% of the North Sea haddock TAC is transferred to the West of Scotland, significantly more effort may be deployed in the West of Scotland to catch the increased haddock TAC. To avoid jeopardising the recovery of the severely depleted West of Scotland cod stock further, any increase in effort would need to be deployed in a way that ensures that catches of cod are avoided to a much greater extent than has been the case in the past.

STECF also notes that the respective distribution patterns of haddock and cod in the West of Scotland provide scope for spatial management measures. The difference in cod and haddock distributions north and south of the 59°N line has been explored in PLEN-11-03. The current request is not accompanied by any background material such as data and analyses, but the most recent IBTS survey data (Figure 5.4a and 5.4b) again shows that there may be scope to introduce measures that provide an incentive for fishers to target areas where haddock are concentrated and where cod are largely absent. During a short-term science/industry initiative, Marine Scotland Science has run an extensive survey of 5 trips per quarter throughout 2014; spatial data on, e.g. cod

and haddock distributions, are being processed and should become available in the course of the summer of 2015 which could help identify such areas.

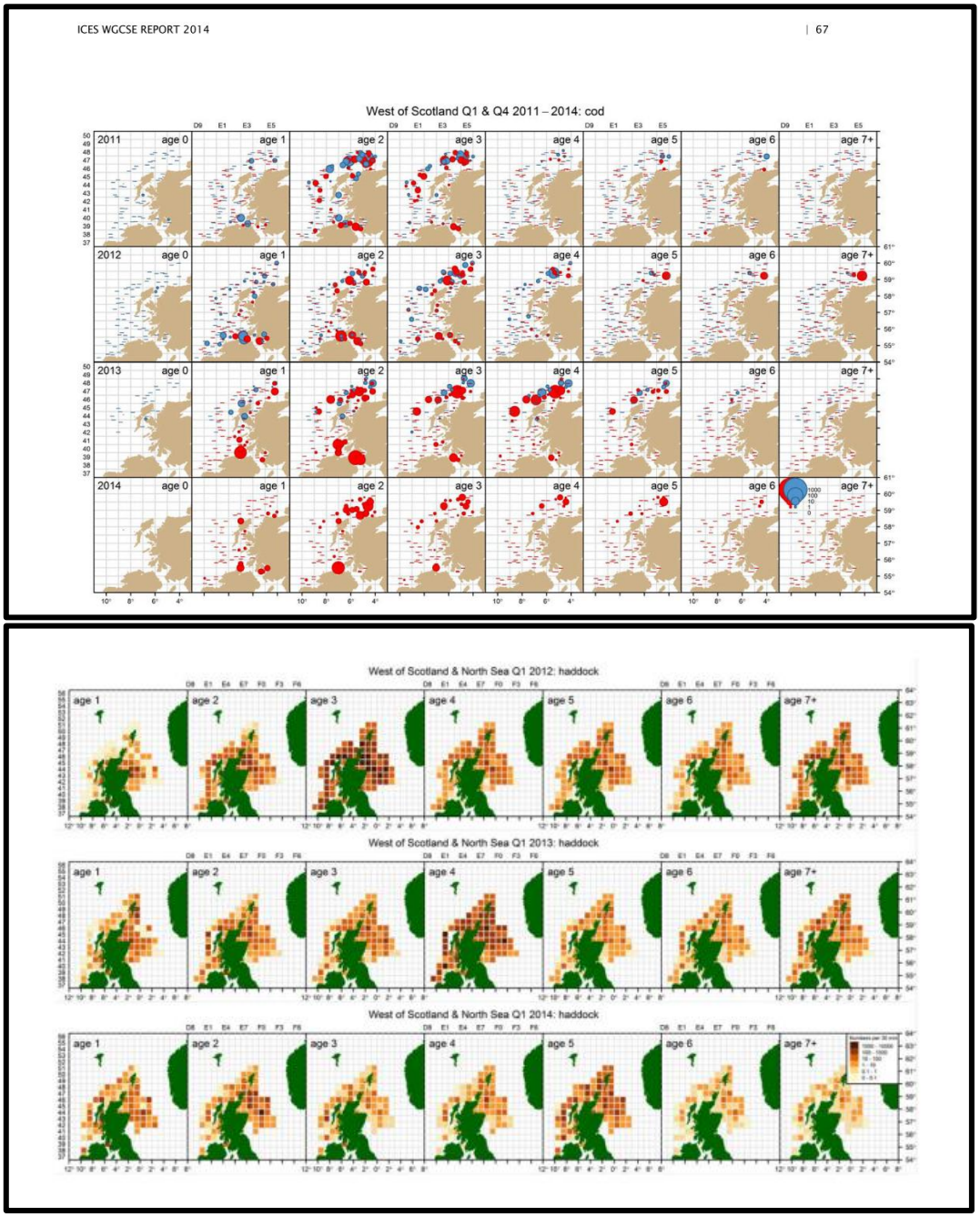

Figure 5.4. Survey distributions of (a) cod in the West of Scotland and (b) haddock in the North Sea and West of Scotland. Figure (a) is taken from the ICES WGCSE Report 2014 and figure (b) from the ICES WGNSSK Report 2014 (ICES granted permission to reproduce these figures. Copyright is with ICES). (a) CPUE numbers for fish aged 1+ per tow resulting from Scottish quarter-4 survey (UKSGFS-WIBTS-Q4) in blue and for Scottish quarter-1 survey (UKSGFS-WIBTS-Q1) in red. Numbers are standardized to 30 minutes towing. (b) Survey distributions by age for the Scottish component of the IBTS Q1 survey (North Sea) and the Scottish West Coast Q1 survey (West of Scotland).

STECF conclusions

Consider the advantages and disadvantages of introducing inter-area flexibility into the haddock TAC and in particular the likely impacts on the cod stock in ICES Area VIa.

Inter-area flexibility could offer the potential advantage to some vessel operators of having more flexibility of operations to comply with the landing obligation, with a reduced risk of having to cease operating before the year end due to quota choke. However, increased fishing opportunities for haddock in the West of Scotland are likely to benefit some Member States and not others depending on availability and access to fishing opportunities for haddock in in the North Sea.

The primary disadvantage of introducing inter-area flexibility of the haddock TAC is that increased fishing opportunities for haddock in the West of Scotland would be likely to increase mortality on the cod stock in that area. However, the extent of the increase in fishing mortality on cod could be mitigated if management measures are introduced to restrict demersal fishing effort to areas of low cod density noting that existing

A potential mechanism to mitigate against an increase in fishing mortality on cod, might be to allocate fishing opportunities for haddock so that they can only be taken in areas, e.g. statistical rectangles, where cod density is low. The Real Time Incentives (RTI)-approach (Kraak *et al*. 2012 and http://rti-for-fisheries.info/) is an incentive-based approach designed to encourage fishing in areas where vulnerable stocks are avoided and discourage fishing in areas where vulnerable stocks would be impacted most. Such areas could be identified based on scientific analyses of data from surveys such as the IBTS, or the science/industry initiative by Marine Scotland Science mentioned above, or perhaps real-time data. In so doing the potential disadvantage of increased mortality on cod arising from haddock quota transfer could be reduced and the cod stock could benefit from reduced fishing mortality provided an extensive amount of fishing effort is incentivised towards areas of low cod abundance.

However, this is only likely to be realised if a very large proportion of all fishing opportunities for haddock in VIa (i.e. the agreed TAC plus any additional transfer from Subarea IV) were restricted to areas where the fishable biomass of cod is low. In practice, while large scale redistribution of effort into areas of low cod abundance may reduce cod mortality from the current high level, such a transfer may still result in cod catches that are in excess of MSY and could also increase fishing effort in some areas that currently have limited fishing effort.

Identify the level of inter-area flexibility that might be applied in further management of the haddock stock(s) across the two areas, which would not risk increasing fishing mortality on the stock of cod in VIa to such an extent as so creating a risk for their recovery.

STECF notes that fishing mortality on West of Scotland cod is currently well above F_{lim} and has actually increased in the recent past. Furthermore, despite the application of the cod recovery plan in VIa, the partial fishing mortality on cod by the fleets fishing under Article 13 has actually increased by 153% between 2010 and 2013. The provisions of the cod plan were intended to reduce fishing mortality on cod by 64% over the same period (STECF PLEN 14-03).

Based on 2013 data submitted to ICES, the catches of cod from VIa exceeded the agreed TAC by approximately 90% which means that fishing mortality would have had to have been 80% lower than that estimated by ICES in order to achieve F_{MSY} (F_{2014} = 0.96; F_{MSY} = 0.19). The majority of the cod catches from VIa are taken by vessels with fishing opportunities for haddock in that area.

STECF (PLEN 10-03) previously concluded that "*Landings data show that the shelf fishery is dominated by haddock, megrim, whiting and to a lesser extent cod. The maps indicate that there is significant mixing of all species (with the exception of whiting) along the 200m contour both east and west of the management line*."

Therefore, STECF considers that an increase in fishing opportunities for haddock through a transfer of additional quota from subarea IV will undoubtedly exacerbate the problem of over-quota cod catches, lead to an increase in fishing mortality on cod and further increase the risk to the recovery of the cod stock in VIa. STECF concludes that without additional effective management measures to control fishing mortality on VIa cod the agreed TACs for 2015 for both VIa cod and VIa haddock are not likely to deliver the large reduction in fishing mortality on VIa cod that is required to achieve F_{MSY}. STECF further concludes that if effectively implemented, the incentive-based approach discussed above, which is designed to encourage fishing in areas where catches from vulnerable stocks can be avoided and discourage fishing in areas where vulnerable stocks would be impacted most, may deliver some reduction in fishing mortality on cod. Any such reductions however, are unlikely to be sufficiently large to achieve F_{MSY} on VIa cod and the problem would be exacerbated through additional fishing opportunities for haddock in VIa.

For the above reasons, STECF is unable to envisage any level of inter-area quota flexibility that would permit a transfer of fishing opportunities for haddock from Subarea IV into Division VIa that would not risk increasing fishing mortality on the stock of cod in VIa, thereby posing an additional risk to the recovery of the cod stock and the ability to achieve F_{MSY}.

> *Review earlier advice on cod avoidance, identifying any areas of spatial or temporal separation in the cod and haddock distributions.*

Regarding the identification of the spatial and or temporal separation of the distributions of the populations of cod and haddock to the West of Scotland, the STECF advice given in the report of the November plenary meeting in 2011 (PLEN-11-03) remains valid; there is the potential for spatial and/or temporal separation. The most recent IBTS distribution maps provide additional evidence in support of that advice (Figure 5.4). While cod densities seem to be relatively high north of latitude 58°N line and in the North Channel between Scotland and Northern Ireland, there are areas of relatively high haddock densities and low cod density in between these areas. Later in 2015, data from Marine Scotland Science will become available and may prove useful to explore spatial approaches quantitatively, although longer time series might be needed to provide a more robust analysis.

5.5. Sole VIIa, VIId, VIIf and VIIg - Assessment of the management measures taken by Belgium

Background

During the Fisheries Council in December 2014, the Belgian authorities issued two distinct statements in which they committed to increasing no later than 1 April 2015 the selectivity of their vessels catching sole in VIIa, VIId, VIIf and VIIg (see 'Documents'). The increased selectivity will be achieved in beam trawls by increasing the mesh size in the extension piece from 80 to 120mm and the Belgian authorities translated this commitment by means of a ministerial decree. Gear trials were conducted in VIId and IVc in January 2015 and the Belgian fisheries institute ILVO provided a document summarising the results of the trials (see 'Documents').

Documents

- Statement made by the Belgian authorities and the Commission in December 2014 (on sole VIIa, VIIf and VIIg)
- Statement made by the French and Belgian authorities and the Commission in December 2014 (on sole VIId)
- Report on the sea trials submitted by the Belgian authorities
- Raw data pertaining to the sea trial submitted by the Belgian authorities
- Additional information on sole in the Irish Sea

Background documents are available on: https://stecf.jrc.ec.europa.eu/web/stecf/plen1501

Request to the STECF

The STECF is requested to assess the report submitted by the Belgian authorities. If data deficiencies or other constraints prevent the STECF from fully addressing any of the questions, the STECF is requested to provide a qualitative answer if possible and indicate what additional data are needed to provide a quantitative answer. In order to frame the assessment, the STECF is requested to answer the following questions and is invited to make additional comments if appropriate.

1. The STECF is requested to comment on the representativeness of these trials based on 48 hauls performed from 3 to 11 January 2015. Comment on the representativeness of the trials carried out in terms of catch composition in other areas as well as the robustness of the data collected from the experiments conducted.
2. With such gear, what selectivity change is expected for targeted and non-targeted species, including species usually discarded? If suitable, a table or other format may be used to answer this question.
3. To answer the following questions, the STECF shall consider *i.a.* that only Belgium committed to implementing these selectivity improvements, hence the selectivity effects on the respective sole stocks would depend on the Belgian quotas and/or the so called 'adapted quotas' (*i.e.* taking into account swaps), if applicable. Depending on data availability, the STECF may examine this question within the context the MSY framework or the precautionary framework.
    a. What would be the effect of such gear on the reaching of MSY? If managers follow the TAC advice, would the enhanced technical measures help attain F_{MSY} within a shorter timeframe?
    b. What is the expected contribution of that gear in terms of decreasing fishing mortality (i) of the sole stocks, (ii) of other target species, (iii) on decreasing catches of undersized fish and (iv) on decreasing catches of unintended catches? The STECF shall *i.a.* comment on the effect of such gear on the stocks concerned, for instance on the L_{50}. Results may be presented in a table if suitable.
4. Assess the effects of such gear on the profitability of the Belgian fleet exploiting the sole stocks in VIIa and VIIfg.
5. The STECF is requested to inform the Commission on possible alternative gear settings (including a combination of selective device and gear) that would allow achieving better results in terms of (a) selectivity, (b) commercial catch loss and fleet profitability, (c) social impact, if possible and (d) environmental impact, if possible.

6. The STECF is requested to assess and comment on the environmental, economic and social effects brought about by the possible utilisation of such gears referred to in question 1 and 5 by all the EU fleets targeting sole in VIIa, VIId, VIIf and VIIg.

STECF response

ToR 1

1. The STECF is requested to comment on the representativeness of these trials based on 48 hauls performed from 3 to 11 January 2015. Comment on the representativeness of the trials carried out in terms of catch composition in other areas as well as the robustness of the data collected from the experiments conducted.

STECF thoroughly reviewed the description of the trials and of the data provided. STECF acknowledges that 48 hauls represents a large number of hauls and that a large range of sole length classes was caught, allowing a catch comparison between control (existing) gear and experimental gear to be conducted. From a catch comparison point of view, STECF agrees that the trials demonstrate interesting results, and compared to the control gear, the experimental gear retained almost as much fish above MLS but with significantly better escapement of the fish below MLS..

However, STECF has some concerns regarding the representativeness of the trials, and these are listed below:

- No information is provided on the standard gear currently used by the Belgian beam trawl fleet. All data collected under STECF and ICES record information on nominal mesh size in the cod end. It is uncertain whether there is any difference between the mesh size used during the trials and those used by the wider beam trawl fleet (BT2). Similarly, no data on other aspects of gear design that influence selectivity (e.g. twine thickness, cod-end circumference etc. [EWG-15-01]) is routinely reported. Hence STECF has assumed that the fleet currently uses a gear similar to the control net of the trial, but that is not based on or supported by information. If there are any significant differences between the control gear used in the trials and that used by the wider Belgian BT2 fleet, then this will result in a potential bias when using catch comparison data to assess/forecast broader biological (stock) and economic (fleet) impacts.
- The trials were performed in the southern North Sea and eastern English Channel, but no positional data were provided, so it is not possible to assess the extent to which hauls were spread over different areas. A map showing the simultaneous distribution of the trial hauls in relation to the distribution of the Belgian beam trawl fleet (e.g. a VMS plot) would have been useful to enable STECF to comment on the spatial validity or otherwise of the trial hauls. Also, STECF notes that while a portion of the trial hauls were conducted in the North Sea, STECF is unable to determine whether the results obtained from the North Sea are statistically similar to those obtained from the Eastern Channel or whether they are representative of the other areas to which the current request relates. Hence, in the present analysis, STECF has assumed that there are no population-dependent issues that could influence the conclusions arising from using data partially gathered in the North Sea during the trials and applying it to other areas.

- The gear tested in the trials does not seem to exactly reflect the stated commitment of Belgium. Belgium has committed to increase the mesh size from 80mm to 120mm for a 3 meter section of the lengthening piece from the cod end. However, the trials were conducted using a slightly different design. Some of the technical specifications in the report of Bayse and Polet (2015) are unclear because the text is not entirely in line with Figure 1. However, based on Bayse and Polet (2015) STECF understands the following:
    - A mesh size greater than 120 mm was used in the lengthening piece. Figure 1 specifies a mesh size of 150mm and the text mentions that the measured mesh was larger than 120 throughout the trial, in both the top and bottom panels of the trawl. It is unclear whether this represents a gear configuration that would have a higher selectivity compared to the commitment made by Belgium authorities and what may actually be used in practice by the wider BT2 fleet.
    - Belgium's commitment is to insert a 3 meter-long 120mm section in the lengthening piece. However, Figure 1 of Bayse and Polet (2015) indicates that a mesh size >120mm was used on two sections of the trawl; one section 17 meshes deep and a second section 40 meshes deep. Based on the nominal mesh size of 150mm, this corresponds to a large mesh extension of 8.55 m in length, which is almost three times as long as the stated commitment. Hence, the experimental gear may have significantly better selectivity compared to a 3m long extension of 120mm. Figure 1 of Bayse and Polet (2015) also specifies features other than mesh size that can potentially affect selectivity:
        - There is a difference between stretched panel width of the extension in the experimental net compared to the control net. The experimental net extension is 66 meshes round with a mesh size of 150mm giving a stretched circumference of 9.9m, whereas the stretched circumference in the control net is 9.0m (90mm, 100 meshes round). Both cod-ends are identical with a stretched circumference of 9.0m. When the cod-ends are joined to the extension pieces, in practice, this will have the effect of opening the cod-end meshes further in the experimental net. Such adjustments have been shown to significantly affect selectivity and therefore, some of the improvements in selectivity observed in the trials may be partly due to differences in cod-end design.
        - Of potentially smaller impact for selectivity, STECF notes that the twine material is different for the bottom panel for the experimental trawl. It is unclear, if or how that may affect selectivity.
    - Additionally, STECF notes that landings of young fish of the species and in the area of interest are usually very low during the first quarter of the year compared to the remainder of the year. According to ICES WGNSSK 2014 Table 9.2.4 (quarterly landings composition), quarter 1 represents 19% of the total landings in tonnes, but less than 10% of the landings of ages 1 to 3 (in numbers). The distribution of discards at age and quarter is not published by ICES, but total discards (all gears) are estimated by ICES in the range of 10% of catch weight. According to the STECF effort database, discards from the Belgian beam trawl for sole VIId were around 11% in 2013. Discard length distributions provided in background document (Annex II Information STECF Sole VIId. pdf) show negligible catches of fish below 20 cm. On the basis of all this information, STECF considers that it is likely that, for these vessels using both the trial and the control gear, the proportion and quantity of smaller fish caught are not likely to be representative of the smaller fish caught at other times of the year. Therefore the results from the trial performed only during

the first few days of the first quarter are unlikely to be representative of the selectivity of the trial gears throughout the year, for instance when more numerous small fish are typically retained in the gear (Quarters 2 and 3).

- STECF notes that vessels registered in Belgium represented only 21% by weight all EU sole VIId landings in 2013.

Additionally, STECF considered that the model fitted to the catch comparison data as presented in Bayse and Polet (2015) was not statistically appropriate, given that the shape of the catch comparison curve was distinctly non-linear (Figure 5.5.1).

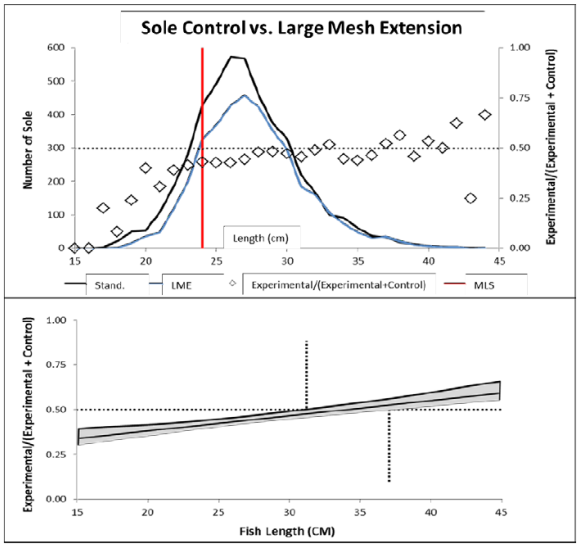

Figure 5.5.1. Length frequencies of sole (*Solea solea*) and observed proportions (experimental /(experimental+control)) (top figure). Generalized linear mixed model (GLMM) modelled proportions of sole at length caught in the experimental trawl with the large mesh extension, as reported in Bayse and Polet (2015) (bottom figure). Interpretation: a value of 0.50 indicates an even split between the experimental and the control, whereas a value of 0.75 indicates that 75% of the total sole at that length were caught in the experimental and 25% were caught in the control. The solid line is the mean curve and the shaded areas around the mean curve are the 95% confidence regions. A vertical dotted line displays the length where a significant difference occurs.

As raw catch data per haul were provided, a new catch comparison analysis was conducted by STECF using the software tool SELNET that offers a broader variety of size selection models and methods for analysis, including the double bootstrap technique. This technique was applied by STECF and the data were reanalysed (see also STECF PLEN 14-03 report for an equivalent re-fitting of a model on selectivity data). The catch comparison is performed by modelling the proportion (r) of the codend catch in the experimental trawl (Cexp) and the catch in the traditional trawl (Ctra).

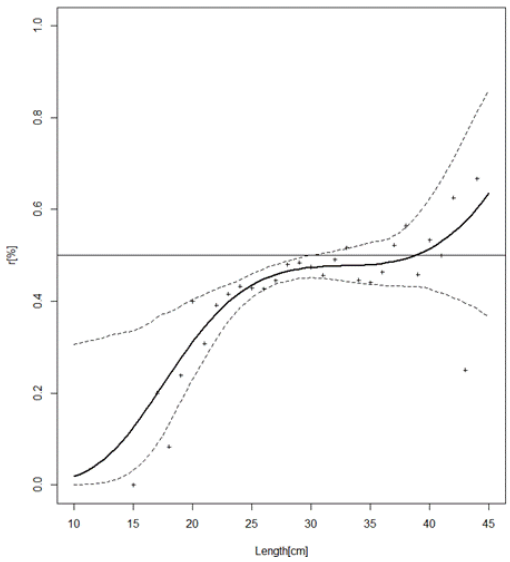

Figure 5.5.2. Results of reanalysis of catch comparison data undertaken by STECF using the SELNET software.

Interpretation: a value of 0.5 indicates an even split between the experimental- and the traditional trawl, whereas a value of 0.75 indicates that 75% of the total fish at that length were caught in the experimental trawl and 25% were caught in the traditional trawl. Cross points are pooled experimental proportions and the dotted lines around the mean catch ratios curve (bold lines) represent the 95% confidence regions. Substantial differences between the original model presented in Bayse and Polet (2015) and the model derived from the STECF reanalysis of the data have been found (Figure 5.5.2).

STECF considers that many of its observations above are important to note when assessing the representativeness of the trial. However, it is not possible to assess whether undertaking the trials in other areas or seasons would have resulted in significantly different catches at length than those observed in the trials. It is likely that the presence of more "small" fish may have improved the precision of the selectivity estimates, but it is unlikely that it would have affected the mean selectivity estimate derived from the SELNET model. There appears to be substantive differences between the experimental gears tested and those proposed by the Belgium authorities, namely differences in panel length (3m v 8.55m) and mesh size (120mm nominal v >120mm. So the results presented here can be considered as the optimistic upper range of selectivity (maximum avoidance achievable with this particular extension) rather than an average value likely to be achieved by use of the experimental gear throughout the year.

STECF was also asked to consider whether the results are representative for other areas. Since this is largely the same opportunistic fleet that is operating across areas – and thus likely the same vessels and standard gear, it might be expected that results are applicable across areas. However, the actual impact of the change will depend of the relative proportion of small fish in different sea areas. STECF notes that the current age structures of populations and catches are different across regions. According to ICES forecast data for 2014 (from ICES Expert Group Reports), the three stocks have comparable population levels at age 2, but sole VIIa has much less individuals of age 3 than the other two stocks. Therefore, even if the relative selectivity-at-age might be transferable across regions, the true effects of increased escapement on the populations might be very different. This is developed in more details in the response under 3 below.

2. *With such gear, what selectivity change is expected for targeted and non-targeted species, including species usually discarded? If suitable, a table or other format may be used to answer this question.*

No information was presented in the trial results on the catches of species other than sole therefore STECF is unable to address this question.

According to the Belgian data submitted to the 2014 STECF Effort data call, for Belgian beam trawls with mesh size 80-99 mm, sole represented 17% of landings in 2013, and plaice 24%. The remaining 59% of the landings were composed of over twenty different species, none of them making a significant individual contribution (with the exception of Anglerfish, 7%). Therefore, any potential effect of the change in gear may be small in terms of absolute quantity, but the actual effects at population level cannot be quantified. A specific description of the by-catches of skates and rays by area in 2014 was provided, but no indication was provided on the effect of the selective trawl extension on these species.

3. *To answer the following questions, the STECF shall consider i.a. that only Belgium committed to implementing these selectivity improvements, hence the selectivity effects on the respective sole stocks would depend on the Belgian quotas and/or the so called 'adapted quotas' (i.e. taking into account swaps), if applicable. Depending on data availability, the STECF may examine this question within the context the MSY framework or the precautionary framework.*

    a. *What would be the effect of such gear on the reaching of MSY? If managers follow the TAC advice, would the enhanced technical measures help attain F_{MSY} within a shorter timeframe?*

    b. *What is the expected contribution of that gear in terms of decreasing fishing mortality (i) of the sole stocks, (ii) of other target species, (iii) on decreasing catches of undersized fish and (iv) on decreasing catches of unintended catches? The STECF shall i.a. comment on the effect of such gear on the stocks concerned, for instance on the L_{50}. Results may be presented in a table if suitable.*

To address the above questions, it was necessary to convert the length-based selectivity data into age-based information that can then be used in an age-based assessment and forecast. STECF used a Von Bertalanffy growth curve (length-age relationship), with parameters kindly provided by IFREMER Port-en-Bessin laboratory, and fitted on French sole samples in VIId for 2013 : L ~ Linf * (1 - exp(-K * (age - age0))), with Linf = 40.838, K=0.210 and age0=-2.185. The large negative value of age 0 indicates that the fit on the young ages is poor, probably due to a low occurrence of small fish in the samples from commercial fisheries. Consequently, the average lengths of sole age 1 and 2 are likely to be overestimates, especially if the samples were mainly taken in the fishery in the second half of the year. Nevertheless, this does not affect the validity of the analyses below.

Bayse and Polet (2015) noted that total catches of fish below MLS were reduced by 40% (in number), Using the length-age relationship above, STECF assumed that fish less than 20 cm are 1 year old, and that fish between 20 and 24 cm (MLS) are 2 years old. Referring to the catch comparison above, this means that for age 1, using a catch ratio around 0.2 means that catches of age 1 sole are reduced by 75% with the experimental trawl, compared to the control trawl. At age 2, a catch ratio around 0.4 means that the catches are divided by 1.5 (a reduction of 33%) with the

experimental trawl. Additionally, Bayse and Polet (2015) noted that catches of fish above MLS were reduced by 16%, and according to the length distribution provided in Figure 5.5.1, this reduction is mainly comprised of fish that are just above MLS (24-27 cm). Given this evidence STECF used a 16% reduction of catches at age 3 and 0% reduction for older ages as assumptions for the effect of the experimental gear relative to the control gear.

For sole VIId **:** Belgium beam trawl vessels represented around 20% of EU landings of sole VIId in 2013. According to ICES InterCatch data (Figure 5.5.3), the Belgian landings composition is slightly less centred on younger ages than those landed from the French fisheries. This observation is consistent with the VMS plots provided in the background document (Annex II), which show that Belgian fisheries operate in offshore areas, well outside coastal nursery areas. Also, given that French vessels generate the majority of EU landings of the stock, the catch composition of the entire stock would be only slightly affected by a decrease in the catchability of small sole in the Belgian fisheries.

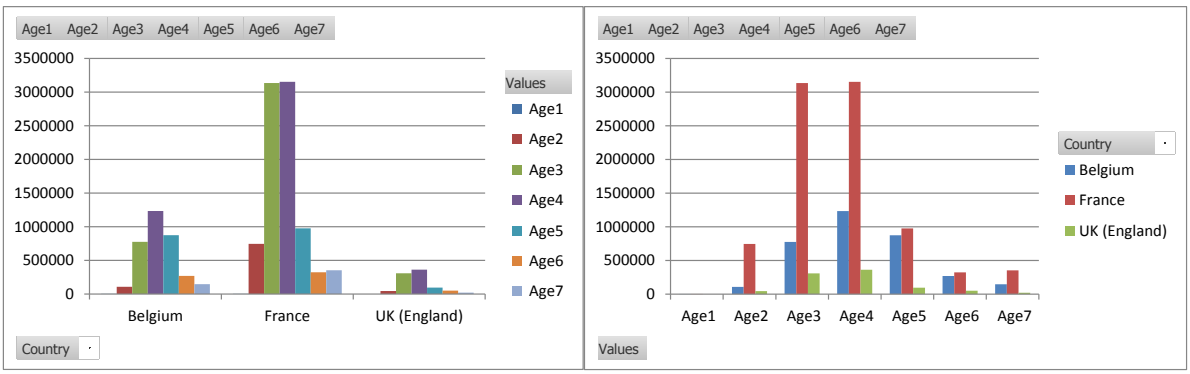

Figure 5.5.3. Composition of the sole VIId landings in 2013 (raw data provided to ICES InterCatch). Left: by country over ages; Right: by age over country.

On the basis of catch number at age by country presented in Figure 5.5.3 and assuming the catch reduction values above, introduction of the experimental trawl in the Belgian fisheries alone, would represent a reduction of around 20% of the total landings at age 1, a reduction of around 4% at age 2 and a reduction of 3% at age 3 (age structure in 2013).

Discards are not included in the assessment, but discards length distributions were provided in Annex II of Bayse and Polet (2015). Discards of small fish < 20cm by Belgian vessels were negligible in 2013, indicating that the gears deployed by the fleet in 2013 were not catching and retaining high volumes of these smaller fish. The highest proportion of sole discards was fish just below the MLS (24cm) with very low volumes above 24cm, indicating that fish were discarded because they were undersize fish. An increased escapement for sole 20-24cm with the new gear would (relative to the control gear) contribute to a 33% reduction of discards (in number) for this fleet. According to STECF effort database, discards of sole from VIId by Belgian BT2 fleet was 115t in 2013 (discard rate of 11% by weight), A 33% reduction of this in the same year would have reduced discards to around 76t (a discard rate of 7.7%)

In terms of fishing mortality and MSY, the reference fishing mortality is calculated on ages 3 to 8. In 2015, the potential 3% reduction of catches at age 3 would have an insignificant effect on F. The effect on F of increased escapement of the younger fish will not appear before 2016. On this basis,

STECF did not recalculate a short term-forecast for sole VIId for 2015. Providing additional quantitative insights beyond 2015 would also require a more advanced modelling MSE (Management Strategies Evaluation) setup, which represents more work than could be achieved during a plenary meeting. Nevertheless STECF notes that sole VIId recruitment was low in 2012 and 2013. Should low recruitment rates continue any measure likely to reduce mortality on young ages, albeit minor, will have a positive effect on the stock biomass in the short-term and for yields in the medium-term.

***For sole VIIfg*:** Belgium beam trawl vessels represented 73% of the EU landings in 2013, and beam trawlers of all MS together accounted for 86% of total EU landings. However, assessment data shows that landings of sole at age 1 are negligible. Discards are also considered negligible. Therefore, the potential effect on the stock size of the increased escapement from the new gear for the fish less than 20 cm is likely to be negligible.

At age 2 though, the catch composition data provided to ICES InterCatch (Figure 5.5.4) show that landings at age 2 come almost entirely from Belgian beam trawlers. Therefore, a reduction of up to 33% of catches at that age with the experimental gear would translate in an equivalent reduction of fishing mortality at that age in 2015. Assuming that the relative landings proportion of the various fleets in 2015 is the same as in 2013, a 16% reduction of Belgian catches at age 3 would translate into a 14% reduction of fishing mortality in 2015. This will lead to a small increase in the SSB already in 2016.

In terms of fishing mortality and MSY, the reference fishing mortality is calculated on ages 4 to 8. Therefore, the estimate of F_{MSY} will not be affected by a change in selectivity at ages 1 to 3. For the same reason, the effects of the reduction of catches at ages 1 to 3 in 2015 could potentially be included in the ICES forecast to be performed this year (TAC advice for 2016), but they will only be fully measurable in the reference F(ages 4-8) in the stock assessment in 2016 (TAC advice for 2017). On this basis, STECF did not recalculate a short term-forecast for sole VIIfg for 2015. Providing additional quantitative insights beyond 2015 would also require a more advanced modelling MSE (Management Strategies Evaluation) setup, which represents more work than could be achieved by STECF during a plenary meeting. Nevertheless STECF notes that any measure likely to reduce mortality on young ages, even minor reductions in mortality, would have a positive effect on stock biomass in the short-term and yield in the medium-term.

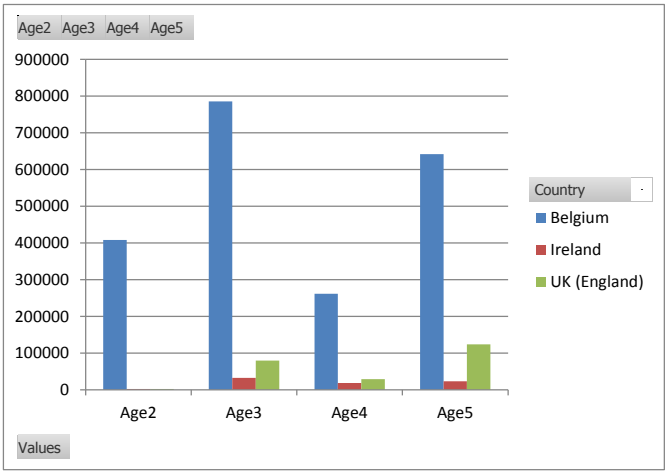

Figure 5.5.4. Composition of the sole VIIfg landings in 2013 (raw data provided to ICES

InterCatch), by age over country.

***For sole VIIa*:** Belgian vessels represented 64% of EU landings in 2013, and beam trawler of all MS accounted for 87% of total EU landings. STECF did not have access to the age information broken down by country and fleet as was the case for the two previous stocks, but STECF notes that both the catch and the population data published by ICES, suggest reduced productivity and low recruitment. In terms of fishing mortality and MSY, the reference fishing mortality is calculated on ages 4 to 8. Therefore, reduction of catches at ages 1 to 3 in 2015 will not affect the estimation of F before 2016. Nevertheless STECF considers that any measure likely to reduce mortality on young ages, even minor reductions in mortality, may have a positive effect on the stock in the short-term and for yield in the medium-term.

4. *Assess the effects of such gear on the profitability of the Belgian fleet exploiting the sole stocks in VIIa and VIIfg.*

The 2014 AER database includes data on catch composition for the Belgian beam trawlers in area 27.7 and information on the economic performance of the beam trawlers. These data were used to assess possible economic consequences of a reduction of the sole landings as assumed in the background information, a reduction in sole landings (above MLS) from area 7 of 16%. The analysis was based on the assumption that the fishing operations and cost structure for vessels targeting Sole would not be affected by the change in gear design and the data from 2008-2013 (2008-2012 for economics) are representative of the current situation of the fleet.

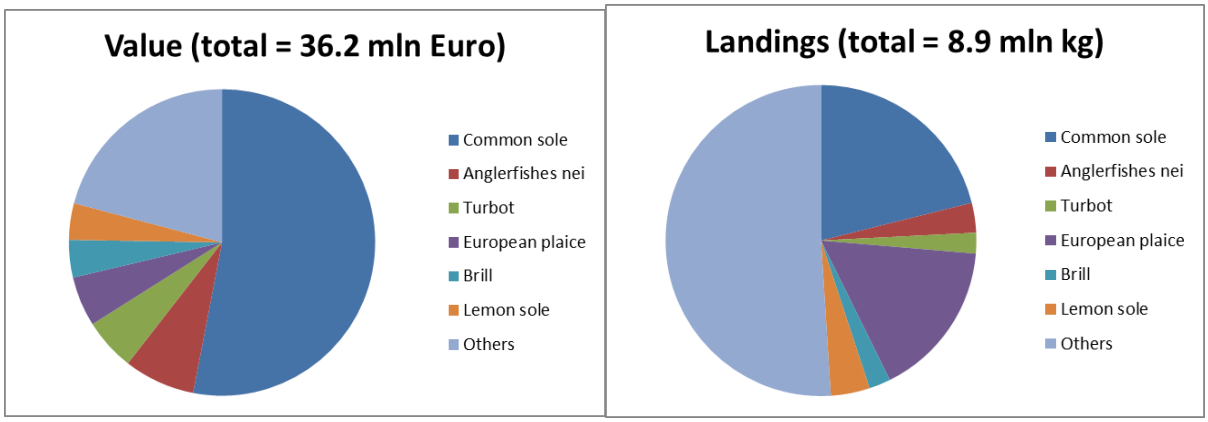

Figure 5.5.5. Average landings composition of Belgian beam trawlers >18 m from area VII for the period 2008-2013. Source; 2014 AER data.

From 2008 to 2013, Belgian beam trawlers landed approximately 1,900t of Area VII sole each year, representing approximately 20% of the total landings. Because of the high price per tonne for sole, the contribution to the landings value was much higher than the contribution to landings volume, more than 19 million Euro, which is over 50% of the landings value over the period.

Assuming that the reduction in sole catch observed in the trials is representative for Belgian beam trawlers, the average reduction in landings if the experimental gear had been used by all Belgian beam trawlers would have been approximately 300t per year. Given that the experimental net is only more selective for smaller fish, the value of the foregone landings would have been lower than

the average price per tonne for sole, since smaller fish are observed to have lower prices than larger fish. The average annual revenue foregone due to not landing 300t of smaller fish would be approximately 2.4 million Euro. This would amount to approximately 4% of the average annual value of sole landings by these vessels and (assuming no change to costs) would reduce the already low profitability of the Belgian beam trawlers from -1.6 million Euro in 2013 to – 4.0 million Euro in year one of using the experimental net due to foregone landings (losses) that would occur through the use of the more selective gear .

The reduction in landings value here can be seen as a worst case scenario for a number of reasons:

- The effects of increasing the mesh size from 80-120 mm will probably lead to a smaller decrease in marketable fish than shown by the experiments as shown above given the possible difference between the gears tested and the specification in the statement of the Belgian authorities.
- In practice the sole landings by Belgium beam trawl vessels are already limited by the TAC, so the use of the alternative gear will not cause a change in landings, but most probably only reduces the amount of over quota discards.
- A substantial part of the sole landings from that fleet come from stocks in the North Sea and Western Channel which are not affected by the change of gear.
- The data used have been collected during a period of high fuel price, whereas fuel prices in 2015 are low and the profitability of the fleet will likely be higher in the short-term.
- These estimates should only be seen as the immediate loss following the introduction of the new gear, but do not take any account of the biomass increase that the selective gear might bring, which will potentially bring higher CPUE and higher yield already in the short term.

All of these conclusions stated above are based on the current situation with relation to obligations to discard fish below minimum landing size, and do not take into account the effect of the landing obligation. The implementation of the LO will considerably alter the effects of fishing with the experimental gear, as sole catches will fall under the landing obligation and therefore must be landed. Because of this, the low sole TAC will choke these vessels and therefore a gear that lowers the catch of undersized sole is unlikely to result in a negative economic effect relative to the control gear, but is likely to increase fishing opportunities for these vessels relative to fishing with the control gear, as the sole TAC will probably take more fishing days to catch, and the average price per tonne for higher average size fish would probably result in higher revenues per tonne landed.

5. *The STECF is requested to inform the Commission on possible alternative gear settings (including a combination of selective device and gear) that would allow achieving better results in terms of (a) selectivity, (b) commercial catch loss and fleet profitability, (c) social impact, if possible and (d) environmental impact, if possible.*

STECF considers that this question cannot be answered in the course of a plenary meeting, as it requires an entire study investigating the existing knowledge on alternative selective devices for the gears in place, the transferability of other devices tested in other fisheries, and a comprehensive bio-economic and ecological analyses of such transfers. Notwithstanding STECF is able to make some general comments and highlight a number of useful studies and analyses.

To date, the primary focus in terms of improvements in selectivity of beam trawls has generally centred around three broad areas: exclusion or avoidance of (i) plaice, (ii) cod and; (iii) benthos (see Depestele, *et al*, 2008 for a comprehensive review of measures). STECF has previously reported on methods to reduce unwanted catches and assessed the economic impact associated with some broad assumptions (see SGMOS 08-01). Given that the primary focus has been on the reduction of unwanted catches and that discarding of sole tends to be low (<10%) there are few studies that have investigated the selectivity of sole as this has not been considered a primary issue for beam trawl fleets.

http://stecf.jrc.ec.europa.eu/documents/43805/44880/08-06_SG-MOS+08-01+-+Reduction+of+discarding+practices_JRC49008.pdf

http://www.vliz.be/nl/open-marien-archief?module=ref&refid=120877

6. *The STECF is requested to assess and comment on the environmental, economic and social effects brought about by the possible utilisation of such gears referred to in question 1 and 5 by all the EU fleets targeting sole in VIIa, VIId, VIIf and VIIg.*

For sole VIId, most of the beam trawl fishery is operated by Belgium. So extending the use of the selective trawl extension to the French and English beam trawl (2% of 2013 landings for each fleet) will likely only have a minor effect.

For sole VIIfg, beam trawl is the main fishing gears, and UK accounted for on average 17% of the landings (2010 – 2013), indicating that this fleet could be a candidate for using the selective extension. STECF notes however that according to the age distribution provided to ICES InterCatch in 2013, UK and Irish landings have very limited landings of age 2 compared to Belgium. The reasons for this difference could not be determined.

For sole VIIa, beam trawls account for the majority of landings and Ireland accounted for 27% of the international landings in 2013, indicating that this fleet could be a candidate for using the selective extension. STECF was unable to obtain the age composition of the Irish catches during the plenary meeting and is therefore unable to assess what the potential impact of the selective extension would be if it were introduced into the Irish beam trawl fleet.

STECF conclusions

In summary, not all requests to STECF could be fully addressed, as some of them are beyond the scope of what STECF can answer in the course of a plenary session although it is probable that more comprehensive responses could be provided through ad hoc contracts or other means.

STECF considers that, notwithstanding some slight concerns on the representativeness of the trials performed, the suggested modification of the trawl extension committed to by Belgium can potentially result in a reduction in the catch of small fish without dramatically affecting the catch of fish above the MLS.

The generic conclusions are that for sole stocks in areas VIIa, VIId and VIIfg, any measure likely to reduce mortality on young ages, may have a positive effect on stock biomass in the short-term and on yield in the medium-term. However, a quantitative assessment of any effects might not be possible before 2016.

Additionally, since sole discards by Belgian beam trawlers are mainly undersize fish, the improved escapement of small fish would reduce volumes of fish discarded and would to some extent mitigate any negative business impacts arising through implementation of the landings obligation.

5.6. Skates and rays – Assessment of the TACs calculation method proposed by the French authorities

Background

Until 2009, the skates and rays were landed in the European Union under the generic term 'rays' under FAO code SRX. As a consequence, data available at species level were scarce and ICES advice pooled together a certain number of species. For the first time in June 2014, ICES presented individual advice for a range of skates and rays species. However, the TAC is a combined TAC covering a range of skates and rays.

During the Fisheries Council in December 2014, the French authorities proposed a new TAC calculation method for skates and rays. Various Member States indicated that they could support this method (see 'Documents'), but Council and Commission agreed to first ask for scientific assessment of the method. The method is designed to take into account the magnitude of the landings of the various rays' species when setting the TACs.

Documents

- Joint statement made by the Council and the Commission in December 2014
- Calculation method presented by the French authorities
- Simulation of TACs calculations when applying the new method
- STECF advice on a possible by-catch allocation for the undulate ray in certain ICES areas[3]

Request to the STECF

The STECF is requested to assess the proposal submitted by the French authorities. If data deficiencies or other constraints prevented the STECF from fully addressing any of the questions, the STECF is requested to provide a qualitative answer if possible and indicate what additional data are needed to provide a quantitative answer.

1. The STECF is requested to assess the TAC calculation method submitted by the French authorities. In particular, the STECF shall take into account the foreseeable effects of the application of this method on the species with less favourable conservation status, taking *i.a.* into account the patchy distribution of skates and rays (e.g. impact on species which may be vulnerable but locally abundant). To perform the assessment, the STECF shall answer the following questions and is invited to make additional comments if suitable:

3 http://stecf.jrc.ec.europa.eu/documents/43805/55543/2015-03_STECF+15-03+Possible+by-catch+provisions+undulate+ray_JRCxx.pdf

2. What would be the effect of such method on the reaching of MSY? If possible, the STECF is requested to provide a separate answer for each skate or ray species assessed by ICES. If suitable, the answers may be collated in a table. Depending on data availability, the STECF may examine this question within the context of the precautionary framework.
3. In light of the response to question 2, the STECF is requested to list possible accompanying management measures and provide advice as to the efficacy of those measures, in particular as regards spatial and temporal closures if possible, and the development of a code of practice. To answer this question, the STECF may build on the list of recommendations made in the context of the recent STECF report on undulate ray4 (see 'Documents'), taking into consideration, where suitable, that the scope of the two requests is different5. If closures are deemed useful, the STECF is requested to identify them. As regards a possible code of practice, the STECF is requested to determine whether recommendations other than those made for the undulate ray6 are necessary for skates and rays species in general.
4. If the assessment of the methodology is positive (likely positive effects outweigh potential negative ones), the STECF is requested to comment on the expected environmental, social and economic effects ensuing from the application of this method.

STECF Observations

ICES usually provides advice on the overall exploitation (landings and discards) of the ray and skates species assemblage as well as on several individual species, but at present does not advise that individual TACs be established for each species. This is because the catch statistics for individual species are not reliable. The current situation is that for the involved stocks, there are no complete and robust analytical assessments and ICES assessments necessarily are based on the ICES framework for data-limited stocks. Changes in survey catch rates is the main indicator of evolution of stock status. A recommended change in catch is applied according to change in survey indices, with a ±20% uncertainty cap applied in each case. Where no suitable survey index was available, a precautionary decrease of 20% was applied.

STECF notes that for many skates (Rajiformes), the absolute level of catch and stock status are uncertain. Assessments are based mostly on observed trends in survey time series, as these provide the longest time series of species-specific information. This information forms the basis for ICES' advice using its approach to data limited stocks. Such an approach prescribes the proportional change in the level of reported catch based on the changes in the survey estimates of stock size. However, for skates, because the accuracy and current levels of species-specific catches are variable, the level of catch that corresponds to the proportional change cannot always be accurately estimated. Hence in some instances, such an approach does not provide useful advice on future fishing opportunities. Provision of advice is further complicated as fishing opportunities for skates are currently expressed as multiple-species TACs. STECF also notes that since the implementation of the ICES approach to data limited stocks, developments in methodologies for undertaking assessments and providing management advice for data limited stocks have occurred and are documented by FAO and several ICES workshop reports on life history traits. Furthermore a

4 See report above, section 3 on pages 15 and subsequent. Pages 29 and 30 provide a summary of the options assessed: *'Suite of measures'*. Page numbers refer to the Annex I appended to STECF's report.

5 This request concerns all skates and rays caught in targeted and non-targeted fisheries while the request on undulate ray only concerned provisions for the management of by-catches.

6 See report above on page 31: *'Discard survival and development of a Code of Practice'*. Page numbers refer to the Annex I appended to STECF's report.

special issue of Fisheries Research on such developments is shortly due to be published so there is the potential for ICES to review and revise and improve upon its current approach.

STECF also notes that in many fisheries, the survival rate of skates that are caught and discarded can be relatively high (see STECF EWG 14-11). Hence, in those fisheries primarily directed to other demersal species, the obligation to land all catches is likely to result in increased fishing mortality on skates if catches exceed TACs.

In view of the above, STECF suggests that to minimise incidental fishing-induced mortality on skates, consideration should be given to allow over-quota discarding, but that a record should be kept of the estimated quantity (weight) discarded to enable total catches to be estimated. STECF also suggests that no discarding of skates should be permitted unless the quotas for such species have been exhausted. Such a provision would not only minimise over-quota fishing-induced mortality, but would also prevent fisheries directed to other species being closed prematurely, as a consequence of a lack of quota for skates and would also help improve much-needed fishery-dependent catch data for skates.

In the French proposal, it is stated that ICES provides scientific advice for many stocks of skate and rays at the species level but that these stocks are often managed through a global TAC which covers many of them. The individual stocks display considerable variability in both their respective contribution to landings and exploitation status.

1- The STECF is requested to assess the TAC calculation method submitted by the French authorities. In particular, the STECF shall take into account the foreseeable effects of the application of this method on the species with less favourable conservation status, taking i.a. into account the patchy distribution of skates and rays (e.g. impact on species which may be vulnerable but locally abundant). To perform the assessment, the STECF shall answer the following questions and is invited to make additional comments if suitable:

The proposed methodology allows the estimation of a global TAC variation for a given area calculated through a weighted arithmetic mean of the different advices available at species level, using the landings proportion of each species as weights in the calculation.

This global TAC variation is calculated as:

$$\%global\ TAC = \frac{\sum_{sp} landings_{sp} * \%advice_{sp}}{\sum_{sp} landing_{sp}}$$

where $landings_{sp}$ are the landings for each species and $\%advice_{sp}$ are the ICES advice for each species (%reduction or increase in catches).

STECF has concerns regarding the suitability of such approach and its consistency with a precautionary approach.

STECF notes that while the approach is computationally simple, applying this method for the setting of a mixed-species TAC may not offer the desired level of protection for depleted stocks which have commensurately low landings and scientific advice calls for a reduction in landings.

This is because the approach is biased towards stocks which have the highest average landings and in circumstances where the scientific advice is positive for these stocks, then the combined TAC advice is heavily biased towards the advice for these stocks rather than on depleted stocks that have lower landings.

This is illustrated in the example provided in table 5.6.1 below. Five theoretical stocks (A-E) are given; four of the stocks (B-E) are considered as being depleted, and the individual scientific advice for each is for a 20% reduction in catch. One stock is considered as sustainable and the individual advice is for a 20% increase in landings. Stocks B-E have low biomass and the average landings are low (20 – 100t), whereas for stock A average landings are considerably higher (1,000t) in comparison to the other 4. Applying the proposed method, would give a combined TAC advice of a 13% increase which will result in a loss of potential yield for stock A, but may result in substantial departure from the individual TAC advice for the other depleted stocks (+13% as opposed to -20%). For contrast, when the average landings of stock A are broadly in line with those of the others (scenario B), the combined TAC advice is more in line with the single stock advice for the depleted stocks (-13% as opposed to -20%). This example shows that the resultant combined TAC advice is more influenced by the average landings of the sustainable stock rather than towards the status of the depleted stocks.

	Status	Average Landings (Scenario A)	Average Landings (Scenario B)	Individual Species Advice	Scenario A [landings * advice]	Scenario B
Stock A	Sustainable	1,000t	50t	20%	200	10
Stock B	Depleted	20t	20t	-20%	-4	-4
Stock C	Depleted	35t	35t	-20%	-7	-7
Stock D	Depleted	50t	50t	-20%	-10	-10
Stock E	Depleted	100t	100t	-20%	-20	-20
				Combined TAC advice	13%	-12%

Furthermore, STECF notes that in the examples provided by the French authorities, in several cases the advice for each of the species does not necessarily match the ICES advice as in some cases the ICE DLS addition buffer was removed from the calculation. Using the Celtic Sea calculation given as an example, the use of the approach presented would result in a result in a slight increase in TAC of 1.4%, compared to the Commission proposal of -20%, using the method above but following the ICES advice fully i.e. including the DLS buffer, the resultant change in TAC would have been -16.6%.

2 What would be the effect of such method on the reaching of MSY? If possible, the STECF is requested to provide a separate answer for each skate or ray species assessed by ICES. If suitable, the answers may be collated in a table. Depending on data availability, the STECF may examine this question within the context of the precautionary framework.

STECF notes that presently there are no analytical assessments for skates and rays and ICES has not identified MSY proxies for any of the species concerned. STECF is therefore unable to

determine whether such a method would be capable of reaching MSY. Given the response above, application of a global TAC is likely to reduce the probability of attaining MSY for individual species. STECF notes that the current ICES advice is based on the ICES Data Limited Approach and that presently it does not advise that individual TACs applied for a number of reasons and that alternative fishery and species specific measures should be used.

STECF considers that where landings are comprised of a dominant species and that it can be readily distinguishable from other skate species (e.g. *Raja clavata* in the North Sea), then the application of a species specific TAC is appropriate. STECF also notes that in many fisheries, the survival rate of skates that are caught and discarded can be relatively high (see STECF EWG 14-11). Hence, in those fisheries primarily directed to other demersal species, the obligation to land all catches is likely to result in increased fishing mortality on skates if catches exceed TACs.

3. *In light of the response to question 2, the STECF is requested to list possible accompanying management measures and provide advice as to the efficacy of those measures, in particular as regards spatial and temporal closures if possible, and the development of a code of practice. To answer this question, the STECF may build on the list of recommendations made in the context of the recent STECF report on undulate ray7 (see 'Documents'), taking into consideration, where suitable, that the scope of the two requests is different8. If closures are deemed useful, the STECF is requested to identify them. As regards a possible code of practice, the STECF is requested to determine whether recommendations other than those made for the undulate ray9 are necessary for skates and rays species in general.*

STECF considers that the development and contents of fishery or species specific management plans are the remit of managers and interested stakeholders. STECF can help evaluate the potential efficacy of individual measures once these have been identified, provided that sufficient information and data are available. There are a number of different options available for the management of skates and these should be tailored to the specific needs and issues depending on the species and fishery. The efficacy of individual measures will be dependent on a number of unknown factors such as number of vessels engaged in the fishery, metier specific fishing effort, overall contributions to catches, gear type etc.. Measuring the efficacy of area or seasonal closures will depend on their timing, spatial scale relative to the distribution of the stocks of concern and any potential displacement effects. STECF considers that the code of practice developed for the undulate ray is broadly applicable to all skate species.

4. *If the assessment of the methodology is positive (likely positive effects outweigh potential negative ones), the STECF is requested to comment on the expected environmental, social and economic effects ensuing from the application of this method.*

7 See report above, section 3 on pages 15 and subsequent. Pages 29 and 30 provide a summary of the options assessed: *'Suite of measures'*. Page numbers refer to the Annex I appended to STECF's report.

8 This request concerns all skates and rays caught in targeted and non-targeted fisheries while the request on undulate ray only concerned provisions for the management of by-catches.

9 See report above on page 31: *'Discard survival and development of a Code of Practice'*. Page numbers refer to the Annex I appended to STECF's report.

As noted above STECF does not consider the method for setting multi-species TACs for skates appropriate or in accordance with precautionary considerations.

STECF conclusions

STECF considers that the approach of setting combine TACs as described does not offer adequate protection for ray species that require reductions in F. STECF considers it more appropriate that there should be species specific TACs where possible for the main commercial species, this will offer a more appropriate level of species specific management. STECF considers it the remit of managers and other stakeholders to develop and identify the scope and management tools necessary for the development of fishery or species specific management plans and that these elements must be first decided upon before any scientific evaluation can be undertaken.

5.7. Survivability of skate and ray discarded

Background
Article 15 paragraph 2(b) of the landing obligation allows for the possibility of exemptions from the landing obligation for species for which "*scientific evidence demonstrates high survival rates*".

STECF have carried out several reviews of existing information on survivability of discards including skates and rays, (STECF -14-19). STECF have commented on the multitude of factors that influence survivability.

STECF has provided guidance on best practice to undertake survival studies. This includes a detailed description of the methodological approaches available, their advantages and disadvantages and what factors need to be considered when undertaking such studies including sample sizes, selection and treatment of specimens and protocols for the various methods. In this regard EWG-13-16 has identified three methodologies for conducting survival experiments (i.e. captive observations, vitality/reflex assessments and tagging/biotelemetry experiments).

The UK has identified a number of fisheries for skates and rays in North West Waters and North Sea, identifying the relative catch by gear type. (Table 1 below and the background documents). STECF EWG 13-17 provided guidance on the development of survival exemptions from the landing obligation and the evidence base that might be required to underpin such exemptions.

Request to STECF
STECF is asked to:

(1) Review available survivability data for skates and rays detailing the gear type to which this data emanates;

(2) Identify where more scientific evidence is required in order to support an exemption from the Landing Obligation on the basis of high survivability for the areas and metiers listed in table 1 below

Table 1. UK skate & ray fisheries

		Gear					
		BT1&2	GN1	GT1	TR1	TR2	LL1
ICES Area	North Sea (IVab)				Y	Y	
	North Sea (IVc)		Y	Y		Y	Y
	Eastern Channel (VIId)	Y	Y	Y		Y	
	Western Channel (VIIe & VIIh)	Y	Y		Y	Y	
	Bristol Channel (VIIfg)	Y	Y		Y	Y	
	Irish Sea (VIIa)		Y		Y		
	West of Scotland (Vb, VIab)				Y	Y	

STECF observations

In 2013 the combined landings of skates and rays for all gears amounted to 2,640t. Most of the landings attributed to bottom trawling (TR2- 43% and TR1- 25% of the total landings); with 15% attributed to gillnets and entangling nets (GN1) fisheries; 11% to beam trawl (BT2); and a small amount corresponded to trammel nets (GT1- 3%) and longline (LL1- 2%). Skates and rays are fished all year round and do not display a clear seasonal pattern. Landings were lowest in December (data source: background documentation provided to STECF, Seasonality of UK skate & ray fisheries (IG 19-Mar-15).xlsx).

Review available survivability data for skates and rays detailing the gear type to which this data emanates;

STECF has previously tabulated the available information on discard survival for skates and rays and noted (STECF-14-19) that "*In general, the studies identified show that elasmobranchs, specifically species of ray, appear to have the highest and most consistent levels of discard survival, although this will vary depending on fishery conditions and on-board handling. In general, observed survival rates of elasmobranchs under experimental conditions, are typically in excess of 50% across all gears and greater than 80% in many cases*". Table 5.7.1 below provides a synthesis of the results from various survival experiments in different regions and across different gear types.

Common Name	Gear Type	Location	Reference	Min Survival Rate	Max Survival Rate
Rays and skates	Otter trawl	U.K.	Enever *et al*. (2009)	55	55
Rays and skates	Beam trawl	U.K.	Revill *et al*. (2005)	92	100
Rays and skates	Fish trawl	Spain	Rodriguez-Cabello *et al*. (2005)	78	78
Rays and skates	Gillnet	U.S.A.	Hueter *et al*. (2006)	60	69
Rays and skates	Hook and line	U.S.A.	Gurshin and Szedlmayer (2004)	90	90
Rays and skates	Otter trawl	U.K.	Enever *et al*. (2010)	55	67
Rays and skates	Otter trawl	U.S.A.	Mandelman and Farrington (2006)	80	100
Rays and skates	Squid trawl	Falkland Islands	Laptikhovsky (2004)	0	71

Discard survival varies with biological attributes (e.g. species, size, sex and mode of gill ventilation) as well as variety of factors associated with capture (e.g. gear type, soak time, catch weight and composition, handing practices and temperature). (ICES, WKMEDS 2014).

Evener *et al.* (2009) notes that the proportion of skates in poor condition on capture was positively correlated with estimated cod-end weight, so technical modifications to fishing gear aimed at reducing unwanted by-catch were considered would increase the survival of discarded skates.

Identify where more scientific evidence is required in order to support an exemption from the Landing Obligation on the basis of high survivability for the areas and metiers listed in table 1 below

STECF examined the available information on skates and rays discard survival, by fishing gears and areas, in relation to those in the ToRs. Results are summarized below.

According to this table and regarding the fisheries mentioned in the ToRs, STECF is unable to identify survival data for the following area gear combinations:

- TR1 and TR2 in North Sea (IVab);
- GT1 in North Sea (IVc);
- BT, GT1 and TR2 in the Eastern Chanel (VIId);
- TR1 and TR2 in Western Channel (VIIe & VIIh);
- BT1 and GN1 in the Bristol Chanel (VIIfg);
- GN1 and TR1 in the Irish Sea (VIIa) and;
- TR1 and TR2 in West of Scotland (Vb & VIab).

STECF notes that for many of the area/gear/species combinations where there is an absence of survival information, it may worthwhile considering whether there are studies with similar gears and the same species from other areas the results from which could be extrapolated from. STECF notes that while this does not guarantee that the survival results would be the same, provided that the operation of the gears (e.g. soak time/row duration) and on deck handling procedures are similar e.g. time taken to sort catch and that the board environmental conditions are similar, then from a pragmatic perspective, it seems reasonable to assume that the survival rates in other similar gear/species combinations may be comparable. For example, provided that the handling and sorting procedures on board TR2 vessels operating in the Bristol Channel are similar to those on TR1 vessels, then it may be reasonable to assume that the survival rates are broadly comparable. STECF notes that such analogies should not be applied across gear types e.g. assume that the survival rates from longline fisheries would be comparable with gill nets for example.

Table 5.7.2. Survival studies on UK skate & ray fisheries

		species	Gear						
			BT1& BT2	GN1	GT1	TR1	TR2	LL1	
ICES Area	North Sea (IVab)								
	North Sea (IVc)	*Raja clavata*		X			X	X	Ellis *et al.* 2008
		Rajidae	X						Depestele *et al.* 2014
	Eastern Channel (VIId)	*Raja undulata*		X					Ellis *et al.* 2012

	Western Channel (VIIe & VIIh)	*Dipturus batis*		X					Bendall *et al*. 2012
		Leucoraja naevus	X						Ellis *et al.* 2012
	Bristol Channel (VIIfg)	various skates							Enever *et al*. 2009
		Leucoraja naevus					X		Enever *et al* .2010
		Raja brachyura					X		Catchpole *et al*. 2007
		Raja clavata					X		
		Raja microocellata					X		
		Raja montagui							
	Irish Sea (VIIa)	*Leucoraja naevus*	X						Kaiser and Spencer 1995
	West of Scotland (Vb, VIab)								

STECF conclusions

Survival estimates vary widely among fishing gears and species, but generally speaking, observed survival rates of elasmobranchs under experimental conditions, are typically in excess of 50% across all gears and greater than 80% in many cases. STECF (PLEN 14-02) noted that the definition of what constitutes "high" survival is subjective and therefore such a decision requires an element of value judgement and is therefore the prerogative of managers. The STECF considers that it has competence to provide scientific advice on the survival of fish discarded in the fishery and whether the scientific evidence required under Article 15.4(b) (Regulation (EU) No 1380/2013) is sufficiently robust to support the conclusions on the reported survival rates. Such advice can be used by managers to take an informed decision on whether it is justifiable to grant an exemption on the basis of high survival.

According to the results of the review, there is a lack of information on survival on a number of the skates and rays fisheries for which STECF has been requested to identify where more scientific evidence is required in order to support an exemption from the Landing Obligation on the basis of high survivability.

STECF suggests it might be appropriate to consider whether there would be any substantial differences expected between areas for specific gears/species combinations where it can be demonstrated that the gears are operated and deck handling/sorting procedures in a similar same way (e.g. tow duration, soaking time, etc.) before prioritizing the studies on survival to be conducted.

References

Bendall, V. A., Hetherington, S. J., Ellis, J. R., Smith, S. F., Ives, M. J., Gregson, J. and Riley, A. A. 2012. Spurdog, porbeagle and common skate bycatch and discard reduction. Fisheries Science Partnership 2011–2012, Final Report. 88 pp.

Catchpole T.L., Enever and Doran S. 2007. Programme 21: Bristol Channel ray survival. Final Report. Cefas

Depestele J., Desender M, Benoît H.P., Polet H. Vincx M. 2014. Short-term survival of discarded target fish and non-target invertebrate species in the "eurocutter" beam trawl fishery of the southern North Sea. Fisheries Research 154: 82–92.

Ellis J. R., Burt G., Cox L. 2008. Programme 19: Thames Ray Tagging and Survival. Final Report. Cefas.

Ellis J.R., McCully S.R., Silva J.F., Catchpole T.L., Goldsmith D., Bendall V., Burt G. 2012. Assessing discard mortality of commercially caught skates (Rajidae) – validation of experimental results (MB5202).Final Report March 2012.

J Ellis J.R., McCully S.R., Poisson F. 2014. A global review of elasmobranch discard survival studies and implications in relation to the EU 'discard ban'. Working Document to the ICES Working Group on Elasmobranch Fishes, Lisbon, June 17–26 2014.

Enever R.,. Catchpol T.L, Ellis J.R., Grant A. 2009. The survival of skates (Rajidae) caught by demersal trawlers fishing in UK waters. Fisheries Research 97: 72–76

Enever R., Revill A.S., Caslake R., Grant A. 2010. Discard mitigation increases skate survival in the Bristol Channel. Fisheries Research 102: 9– 15.

Kaiser, M. J. and Spencer, B. E. 1995 Survival of by-catch from a beam trawl. Marine Ecology Progress Series, 126: 31–38.

STECF 2013. Scientific, Technical and Economic Committee for Fisheries – Landing obligation in EU fisheries (STECF-13-23). 2013. Publications Office of the European Union, Luxembourg, EUR 26330 EN, JRC 86112, 115 pp.

5.8. UK request of high survivability exemption for Cornish Ring Netters

Background information

The UK has a small-scale fishery for sardine using ring nets in ICES Divisions VIIe and VIIf, within 6 miles of the Cornish coast. Ring net are surrounding nets similar in construction and operation to purse seines and lampara nets:

This fishery is exempted from the landing obligation for pelagic fisheries introduced from1 January 2015 as sardine are not subject to catch limits in area VII; However, in this fishery that are often incidental catches of TAC species, including herring, mackerel and horse mackerel. Such catches or either retained or discarded (slipped) depending on individual vessel quotas and for operational reasons. Such catches of TAC species will come under the landing obligation at the latest by 2019 meaning such catches will have to be landed and counted against quotas

This imposition will be problematic for the vessels operating in this fishery. The fishermen participating in the fishery argue that the method of fishing has a low impact and that fish slipped from ring nets have a high survivability. However, to prove this definitively would be difficult given the nature of the fishery.

Commission Delegated Regulations (EU) No 1393/2014 1394/2014 provide for exemptions to the landing obligation for purse seine fisheries targeting mackerel, herring, anchovy and horse mackerel on the basis of high survivability. Given the similarities between the fishing methods there may be a basis for granting an exemption for the ring net fishery in the future using the information underpinning the existing exemptions as a basis.

Request to STECF

STECF is asked to consider:

(1) On the basis of the available information on the operation of the ring net fishery and the supporting information supplied to support the exemptions for high survivability in purse seine fisheries whether an exemption for the ring net fishery is justifiable.

(2) Identify whether additional information should be developed to support an exemption taking account of earlier advice on survivability experiments provided by STECF.

STECF response

Supporting documentation

The following documentation was provided in support of the request for an exemption from the obligation to land all catches of herring, mackerel and horse mackerel on the grounds of high survivability.

1. Tom Catchpole, Sam Smith, Stefan Glinski, 2015. Assessing feasibility and developing methods for estimating survival rates of discarded (slipped) pelagic fish caught by English southwest ring-netters. Cefas Project report.
2. Irene Huse, Aud Vold, 2010. Mortality of mackerel (*Scomber scombrus* L.) after pursing and slipping from a purse seine. Fisheries Research 106: 54–59
3. Tenningen, M., Vold, A., and Olsen, R. E. 2012. The response of herring to high crowding densities in purse-seines: survival and stress reaction. ICES Journal of Marine Science, 69: 1523–1531.

All back ground documents are available via the following link:
https://stecf.jrc.ec.europa.eu/web/stecf/plen1501

STECF observations

In response to request 1 above, STECF considers that it is beyond the competence of STECF to answer the question of whether it is justifiable on the grounds of high survivability to grant an exemption from the obligation to land all catches of mackerel, herring and horse mackerel for the UK ring-net fishery in ICES Divisions VIIe and VIIf. STECF (PLEN-14-02) noted that the definition of what constitutes “high” survival is subjective and therefore such a decision requires an element of value judgement and is therefore the prerogative of managers. The STECF considers that it has competence to provide scientific advice on the survival of fish discarded/slipped in the fishery and whether the scientific evidence required under Article 15.4(b) (Regulation (EU) No

1380/2013) is sufficiently robust to support the conclusions on the reported survival rates. Such advice can be used by managers to take an informed decision on whether it is justifiable to grant an exemption on the basis of high survival.

Assuming that the fishing operation aboard the MFV White heather is representative of the rest of the Cornish ring net fleet, STECF notes that in practice, the fishing operation of the Cornish ring net fleet will be similar in key respects to the operation of purse seine nets for mackerel and herring. However, STECF notes that no information is provided to determine whether the potential crowding densities of mackerel and horse mackerel in the Cornish ring net fishery are likely to exceed those reported by Tenningen *et al*. (2012) and Huse and Vold (2010). Furthermore, STECF notes that unlike the exemption requests for purse seine operations, the exemption request for ring nets is not accompanied by a proposal to prohibit slipping beyond the point where a stated proportion of the net as been hauled, which could mean that crowding densities could exceed levels that have been shown to induce mortality in other fisheries. Catchpole *et al.* conclude that slipping of fish during the ring net hauling operation occurs for two reasons; 1, to reduce the size of the catch so that it could be handled by the vessel and 2, to release the full catch due to the highly mixed unsaleable composition of the catch. Slipping occurred during the White Heather trials for both of the above reasons. The gear used by MFV White Heather is fitted with marker floats which denote the length and proportion of net that has been hauled at 50% (220m), 75% (330m) and 90% (396m). It is unclear whether other vessels in the Cornish ring net fleet are fitted with similar marker floats. Nevertheless the crowding density is dependent on the size of the overall catch and for some hauls, the crowding density may exceed the levels that have been shown to induce mortality, especially if part of the catch is slipped because it is too large for the vessel to handle.

The trials aboard the MFV White heather were designed to identify and describe the gear used, the fishing operation; determine the feasibility to conduct survival experiments and to develop vitality assessment protocols for the main species caught by the vessels using ring nets. Catchpole *et al.* also provide some information on the potential survival of sardine, herring and mackerel taken during a single fishing operation aboard the MFV White Heather based on a health vitality score. For each species, the number of individuals assessed was small (37 sardine, 26 herring, 1 mackerel). Given the limited information in Catchpole *et al*., STECF considers that these findings do not provide a representative indication of the likely survivability of mackerel, herring and sardine slipped during the ring net fishing operation. The paper notes that the fish caught were in a post-spawning condition and that the probability of survival after slipping may well be different for fish in other stages of their annual reproductive cycle.

STECF notes that, in practice, the ring net fishing operation aboard MFV White Heather is similar to the operation of purse seine fisheries for mackerel and herring in the northwest Atlantic. It is probable therefore, that the survival rates of sardine, mackerel, herring and horse mackerel slipped from ring net used by the White Heather is likely to be similar to the survival rates of those species slipped from purse seine fisheries, provided that the crowding densities do not exceed those observed in the purse seine survival studies.

In its report of the summer 2014 plenary meeting (STECF-PLEN-14-02), STECF provided advice on Joint Recommendations from Regional Groups for discard plans for pelagic fisheries and advice was provided in relation to proposed exemptions from the landing obligation for the following purse seine fisheries and species.

a) *Exemption from the landing obligation for mackerel purse seine fisheries in all areas in NE Atlantic based on high survival.*
b) *Exemption from the landing obligation based upon high survival for North Sea Autumn Spawning Herring (Clupea harengus) in purse seine fishery in Subarea IV and Divisions IIIa and VIId.*
c) *A total exemption from the landing obligation for the anchovy, horse mackerel, jack mackerel and mackerel in purse seine fisheries in ICES areas VIII, IX, X and CECAF 34.1.1, 34.1.2, 34.2.0 based on high survivability.*

The STECF reviews of the information provided in support of the above proposed exemptions from the landing obligation are given in sections 6.1, b, d and e of STECF PLEN-14-02. For exemptions a) and b) above, the supporting documentation was Huse and Vold (2010) and Tenningen *et al*. (2012), which are also provided in support of the current proposal. For exemption c), the supporting documentation was Arregi *et al*. (2014).

Based on their reviews, STECF concluded the following:

With respect to a;

Assuming the experiments undertaken on the crowding effects on mackerel mortality referred to in the JR are representative of the conditions experienced under commercial purse seine fishing operations, in particular crowding duration, the results indicate that implementation of the ***80% rule*** *as described in the JR is likely to result in crowding densities of mackerel less than 30kg m-3 and a survival rate of around 70%. STECF cannot comment whether this constitutes "high" survivability.*

With respect to b;

Based on the figures quoted in the JR from Tenningen (2014), STECF estimates assuming ***70%-80%*** *of the purse net is hauled, then for a catch of herring of 1000 t, the crowding density within the purse would be approximately 7.69kg* m^{-3} *which is much lower than the density where mortality of herring was observed to increase (Tenningen, 2012). There is no supporting information in the JR to indicate what the crowding density is likely to be if 90% of the purse is hauled.*

Assuming the experiments undertaken on the crowding effects on herring mortality referred to in the JR are representative of the conditions experienced under commercial purse seine fishing operations, in particular relating to crowding duration, the results indicate that implementation of an 80% rule is likely to result in crowding densities much lower than those where mortality of herring has been observed to increase.

STECF also suggests that for control and enforcement purposes, it would appear sensible to use a common rule for all purse seine operations rather than have different rules as proposed (i.e. 80% for mackerel and 90% for herring).

With respect to c;

For the exemption for the purse seine fishery on the basis of high survivability, STECF concludes that, assuming the results of the survival study are representative of survival rates under commercial fishing operations, the proportion of slipped fish surviving would likely be greater than 50%. However, it would be advisable to undertake further work to confirm that the experimental conditions are representative of commercial fishing operations.

STECF considers that because of the similarity between ring nets and purse seines and their mode of operation, the survival rate of mackerel, herring and horse mackerel slipped by the Cornish ring

net fishery is likely to be similar to the survival rates of these species slipped from purse seine fisheries for these species. Given that there is currently no reliable information on the survival of mackerel, horse mackerel and herring after slipping from purse seines in addition to that previously reviewed (Huse and Vold, 2010; Tenningen *et al*., 2012), there are no grounds to change the conclusions in relation to exemptions a), b) and c) above and at present they represent the most appropriate conclusions to draw with respect to potential survival of mackerel herring and horse mackerel slipped in the Cornish Ring net fishery.

STECF conclusions

Request 1. *On the basis of the available information on the operation of the ring net fishery and the supporting information supplied to support the exemptions for high survivability in purse seine fisheries whether an exemption for the ring net fishery is justifiable.*

In response to request 1 above, STECF considers that it is beyond the competence of STECF to answer the question of whether it is justifiable on the grounds of high survivability to grant an exemption from the obligation to land all catches of mackerel, herring and horse mackerel for the UK ring-net fishery in ICES Divisions VIIe and VIIf. STECF (PLEN 14-02; PLEN XX-XX) noted that the definition of what constitutes "high" survival is subjective and therefore such a decision requires an element of value judgement and is therefore the prerogative of managers. The STECF considers that it has competence to provide scientific advice on the survival of fish discarded/slipped in the fishery and whether the scientific evidence required under Article 15.4(b) (Regulation (EU) No 1380/2013) is sufficiently robust to support the conclusions on the reported survival rates. Such advice can be used by managers to take an informed decision on whether it is justifiable to grant an exemption on the basis of high survival.

STECF concludes that the supporting information provided on the Cornish ring-net fishery by Catchpole *et al*, (2015), is insufficient to determine the survival rate of slipped mackerel, herring, horse mackerel and sardine. Given that there is currently no additional reliable information on the survival of mackerel, horse mackerel and herring after slipping from purse seines other than that previously provided in support of proposed exemptions from the landing obligation which was reviewed during the STECF PLEN-14-02 meeting (Huse and Vold, 2010; Tenningen *et al*., 2012), the conclusions reached at that time remain valid. Furthermore, at present they represent the most appropriate conclusions to draw with respect to potential survival of mackerel herring and horse mackerel slipped in the Cornish Ring net fishery provided that the expected crowding densities in the Cornish ring net fishery are similar to or do not exceed those observed in survival experiments with purse seines (Huse and Vold, 2010; Tenningen *et al*., 2012).

Request 2. *Identify whether additional information should be developed to support an exemption taking account of earlier advice on survivability experiments provided by STECF.*

The STECF considers that the conclusions given in sections 6.1.b, d, and e of the STECF PLEN-14-02 Report currently provide the most appropriate information on fish survivability to take into account when deciding whether to grant an exemption from the obligation to land all catches of mackerel, herring and horse mackerel taken in the Cornish ring net fishery.

If fishery-specific survival estimates for mackerel, horse mackerel and herring slipped from the Cornish ring net fishery are considered by managers to be necessary to inform their decision on whether to grant an exemption from the obligation to land each of these species, STECF concludes

that ring net fishery-specific survival experiments , adopting the procedures outlined in the (|STECF 13-23), would provide evidence to estimate survival rates of fish being slipped from ring nets.

References

Arregi, L. Onandia, I. Ferarios, J.M., Ruiz J. and Basurko O.C. 2014. Assessing fish survival from slipping in purse seine fisheries of European southern waters. AZTI-Tecnalia, Sukarrieta, 44 pp.

5.9. Joint recommendation for conservation measures in Natura 2000 sites in the Kattegat and in the Baltic Sea

Background

In accordance with Article 11 of Regulation 1380/2013 Member States having direct management interest in certain areas or fisheries may submit joint recommendations for fisheries conservation measures to be adopted by the Commission that are necessary to comply with their environmental obligations.

Denmark initiated the procedure with Sweden and Germany for adopting a joint recommendation for conservation measures in seven Natura 2000 sites in the Kattegat and three sites in the Baltic Sea in summer 2014. After several consultations amongst these Member States, stakeholders and NGOs it is the intention to submit the final joint recommendation to the Commission by 13 March 2015.

Once the joint recommendation is received, it is necessary to evaluate the various elements of the joint recommendation submitted by DK on fisheries measures necessary for compliance with environmental obligations and to identify areas if and where additional supporting information may be required. In particular, it has to be assessed whether the measures in the joint recommendation are compatible with the requirements referred to in Article 11(1) of Regulation 1380/2013. This calls for the review of the supporting scientific information provided.

Terms of Reference for STECF to:

1. Review whether the proposed conservation measures minimise the negative impacts of fishing activities on the marine ecosystem and ensure that fisheries activities avoid the degradation of the marine environment as stipulated under Article 2(3) of Regulation 1380/2013.
2. Review how the proposed measures contribute towards ensuring that the habitats of community interest addressed in the recommendation are maintained and restored at favourable conservation status inside the delineated areas as stipulated under Article 2 of Directive 92/43/EEC.
3. Review how the special areas of conservation set out in Article 6 of Directive92/43/EEC referred to in the joint recommendation can be ensured without the proposed fisheries measures.

STECF comments

In accordance with Article 11 of Regulation 1380/2013, Denmark and Sweden jointly recommend fisheries management measures to the Commission, for adoption as a delegated act. STECF notes that Germany, which also has fisheries interests in the concerned sites, supports the proposal but states that they will follow a different approach regarding their own sites. This does not hinder the Denmark and Sweden joint recommendation.

The overall aim of the proposed fisheries management measures is to ensure protection of reef structures from fisheries in ten Danish Natura 2000 sites, and thereby to contribute to the obligation of achieving favourable conservation status under the Habitats Directive Article 6. All Natura 2000 sites concerned are located within the 12 nautical miles of Danish waters, seven in the Western Baltic and three in the Kattegat.

In these ten Natura 2000 sites, for areas mapped in the proposal, a ban is proposed for fishing activity using mobile bottom contacting gear, i.e. beam trawls, bottom otter trawls, Danish and Scottish seines, and dredges. In addition, for the three Natura 2000 sites of Kattegat where bubbling reef10 are present, the proposed ban extends to passive gears, including all types of nets, lines fishing, pots and traps, and pelagic trawls.

STECF notes that protected areas include all the areas mapped as reefs (habitat code H1170) or bubbling reefs (habitat code H1180), as well as 240 meters wide buffer zone, which is equivalent to 6 times the average water depth, and follows the ICES guidelines (ICES Advice 2013, Book, 1.5.5.2. Special request). The rationale behind the buffer zone method is that reef structure in its full extent needs protection. Bubbling reefs are considered as especially fragile in terms of physical impact, therefore justifying additional protection from fishing activity with passive gears. STECF considers that the proposal restrictions noted above will ensure adequate protection of these reef structures from direct impact from fishing activities, provided that there is full compliance.

STECF notes that the protected areas included in the proposal are small (between 3.4 and 70.4 km^2; 15.4 km^2 on average including buffer zones). The fishing intensity has been estimated by combining log book data and VMS pings following the advice from the ICES group SGVMS/WGSFD. The mean 2010-2012 yearly catch within the 10 Natura 2000 sites all together is estimated to 52.1t (with 34%, 65% and 1% of the catch for Danish, Swedish and German vessels respectively; and with 44% coming from Swedish vessels using traps to catch edible crabs in the Tønneberg Banke). Since smaller fishing vessels below 12 meters do not carry VMS, their activity has only been partially included in the analyses. However, based on dialogue with the Danish Fishermen Association and logbook data from Swedish vessels, the submitted reports specifies that the fishing effort from these smaller vessels is estimated to be very low in the ten Natura 2000 sites concerned.

STECF underlines that the effectiveness of the measures will strongly depend on effective implementation. Control and enforcement of fishery management measures in marine Natura 2000 sites in Denmark is currently based on the VMS and risk-based systems coordinated by the Fishery Monitoring Centre (FMC). The centre is alerted if and when Danish vessels enters a control area of 4 nautical miles placed around the Natura 2000 sites for which fisheries management measures have been implemented. The submitted report states that, with the current low level of fishing activity in these areas no additional control and enforcement measures are required. However,

10 Submarine structures made by leaking gasses as defined in Annex 1 of Directive 92/43/EEC.

Denmark will reassess the need for additional technical control and monitoring equipment 18 months after implementation of the measures.

STECF notes that small vessels not equipped with VMS will not be detected by the current control system. Furthermore, since the control areas are small, VMS vessels could enter the sites in the time period between two VMS pings, currently set at frequency of two hours (Control Regulation EC 1224/2009). Therefore, STECF concludes that the control and enforcement aspect of the proposed management measure should be reviewed, including an assessment of the current VMS ping frequency. Furthermore, the use of other control systems should be investigated in the three Natura 2000 sites where the fishing ban extents to passive gears (often used by small boats which are not equipped with VMS) due to the presence of fragile bubbling reefs.

Finally, STECF notes that over the 97 Danish Natura 2000 sites, a total of 65 sites have been designated for reef structures, from which 45 sites are located in Kattegat and Baltic sea (habitat codes H1170 and H1180). Existing regulation already protects reef structures from fishery activity in 10 of the 45 sites. The current proposal covers an additional ten other sites, and specifies that the remaining 25 sites will be protected at a later stage. Thus, it has to be considered a step forwards in the implementation of the habitat directive. STECF also notes that the Danish marine Natura 2000 network covers 17.6% of Denmark's marine waters. According to the proposal it has been recognized by the Commission as sufficient area to ensure a representative network of marine habitats and species.

STECF conclusions

1. Regarding ToR 1, STECF concludes that the proposed conservation measures, which relates to 10 of the 55 currently unprotected Danish Natura 2000 sites where reef are present, is a step forwards to minimise the negative impacts of fishing activities on the marine ecosystem and ensure that fisheries activities avoid the degradation of the marine environment as stipulated under Article 2(3) of Regulation 1380/2013.

2. Regarding ToR 2, STECF concludes that the proposed measures contribute towards ensuring that the habitats of community interest addressed in the recommendation are maintained and restored at favourable conservation status inside the delineated areas as stipulated under Article 2 of Directive 92/43/EEC.

3. Regarding ToR 3, STECF notes that current catch inside the Natura 2000 sites under consideration seems to be limited. Nevertheless, some fishing activity is present especially by passive gears in at least one area where bubbling reef have been identified. Thus, STECF considers that the conservation objectives within the special areas referred to in the joint recommendation cannot be fully achieved without appropriate measures to prevent fishing activity in the areas. STECF identifies some issues regarding the controllability of the sites. STECF considers that for effective implementation of the measures, the Danish control system that alerts authorities when vessels enter the control area should be extended to all fishing vessels equipped with VMS operating in proximity to the areas. Furthermore, STECF considers that additional measures may be appropriate for fishing vessels without VMS systems (e.g. <12m). These measures should be introduced at the same time as the implementation of the closed areas.

6. STRATEGIC ISSUES/DISCUSSIONS

6.1. Data used by STECF

STECF is asked to map the use of data from the different data calls issued by the Commission (DG MARE) and served by the JRC in support to STECF and other sources. The map should include an analysis on which datasets are used for the different tasks performed by STECF (by the EWGs, the Plenary, ad-hoc contracts) and if possible also information on use by other end users/institutions This analysis should show if there are any datasets called by the Commission (DG MARE) in support to STECF not used, and if datasets have multiple use i.e. they are used for several tasks and whether the use of these datasets is consistent and efficient.

STECF response

The data collected under the Data Collection Framework (DCF) is used primarily in relation to activities undertaken by STECF either directly in plenaries, through STECF Expert Working Groups or STECF initiated ad-hoc contracts. However, there are also a range of other users including researchers, consultants, civil servants, private persons etc.
In order to address who uses the data from the different data calls, STECF has used the following background information:

1) JRC Technical Report, Evaluation of DCF data calls and variables managed by JRC in preparation of the new Data Collection Multiannual Programme (DC-MAP), May 2013
2) Number of accesses to the STECF website https://stecf.jrc.ec.europa.eu/data-reports with data tables since beginning of 2015
3) Ad hoc request for DCF data between June 2014 and April 2015

It is also relevant to notice that Member States in many situations directly utilise the collected DCF data. Obviously this usage is not registered any of the available information above.

STECF activities

STECF has three plenaries every year, around 20 Expert Working Groups and 10-15 ad-hoc contracts. Many of these utilise the data collected under the DCF and called for by the Commission in support to STECF.

The STECF activities can be divided into contents based categories, which utilise the collected data to different extends. In the Table 6.1.1 below, STECF has tried to summarize which data is used within the activities under the respective categories.

Table 6.1.1: Data use in STECF.

	Economic	Effort regimes	Mediterranean/Black Sea	Processing industry	Aquaculture	Ad-hoc data call
Plenary Meeting Reports	X	X	X	X	X	X
Data Collection Framework	X	X	X	X	X	X

(DCF/DCR)						
Economic analysis (fleet, processing, aquaculture)	X			X	X	
Evaluation of Effort Regimes		X				
Management Plans; impacts and evaluations	X	X				
Mediterranean and Black Sea Stock Assessments			X			
Review of Scientific Advice for Stocks						
Balance between capacity and fishing opportunities	X	X				
Environmental Impacts						X
Landing obligation	X	X				
Technical measures		X				X
Strategic issues (eg. ecosystem approach)						X
Ad hoc contracts	X	X		X	X	

Note: See http://stecf.jrc.ec.europa.eu/reports for an overview for the activities under each category. Based on the above overview, STECF observes that all the called data are used. The economic and effort data are generally the most utilised datasets, but all datasets are relevant in relation to the work undertaken by STECF.

Some EWGs work directly with data originating from a call specifically related to the meeting, while other ones use the already collected data in their work.

Besides the data collected under the DCF, STECF utilises a range of other data sources. To mention a few, examples include FAO statistics, Eurostat data and control data.

Other users

There are also a range of other users including researchers, consultants, civil servants, private persons etc.

Other users can obtain access to the collected data in two ways:

1) Using the aggregated tables / electronic report annexes publicly available at the STECF and DCF websites and
2) Applying for access to more detailed data by contacting the Commission

Regarding the first, information is available about the number of hits on the part of the DCF website covering data dissemination and coverage. The statistics are shown in the Table 6.1.2 below. The data related to effort had most hits followed by the economic data. A non-exhaustive list of EU projects and organizations using the effort data can be found in section 5.5 (pages 19-20) of the STECF-PLEN-14-03 report (http://stecf.jrc.ec.europa.eu/reports/plenary).

Table 6.1.2. Hits on DCF data dissemination website for the period 1 January to 3 April 2015.

Data call- data set – view	Number of accesses since beginning of 2015
Effort	**747**
Effort_coverage	**121**
Coverage	35
Timeliness	49
Uploading	23
Uploading progress	14
Effort_public	**626**
Effort	85
Effort by rectangle and quarter	111
Landings and discards	208
Landings by rectangle and quarter	108
Map effort by rectangle	61
Map landings by rectangle	53
Fleet economic	**376**
Fleet_coverage	**30**
Coverage by Fleet segments	14
Coverage by National totals	2
Timeliness	9
Uploading progress	5
Fleet_economic_indicators	**185**
EU Overview	46
Trends by country	67
Trends by fleet segments	72
Fleet_public	**161**
Transversal data by country	31
Transversal data by fleet segments	78
Trends by country	26
Trends by fleet segments	26
Med and BS	**225**
Med and BS	**40**
Effort	8
Landings and discards	32
Medbs_coverage	**72**
Coverage	17
Timeliness	32
Uploading	9
Uploading progress	14
Medbs_public	**113**
Effort	26
Landings and discards	87
Aquaculture	**173**
Aqua_coverage	**88**
Coverage	24

Timeliness	42
Uploading progress	22
Aqua_public	**85**
Economic data by country	20
Economic data by segments	37
Production by species	28
Processing	**39**
Proind_coverage	**12**
Coverage	4
Timeliness	6
Uploading progress	2
Proind_public	**27**
Economic data by country	8
Economic data by segments	19
Total	**1,560**

Source: based on number hits on these websites http://datacollection.jrc.ec.europa.eu/data-dissemination and http://datacollection.jrc.ec.europa.eu/coverage

Regarding the second, several users have asked permission for access to more DFC detailed data between June 2014 and April 2015. Below is an overview of the number of accepted requests and the type of information they have asked for.

Table 6.1.3. Overview on data request June 2014 to April 2015.

Requested by	**Requested data**	**Date of request**	**Project**
Anna Kristín Daníelsdóttir, Ph.D. Coordinator	Fishing effort by Year, Quarter, ICES rectangle, Country, Gear, vessel size Landings by Species, Year, Quarter, ICES rectangle, Country, Gear, vessel size Discards by Species, Age, Year, Quarter, Sub-division, Country, Gear, vessel size Economic Value of the catch by Species, Year, Sub-division, Country, Gear, vessel size.	23/06/2014	MareFrame - http://mareframe-fp7.org
Prof. Nadia Pinardi Laboratorio SINCEM Laboratori R.Sartori University of Bologna	The numbers and the mass of all species Country, Year, Species (scientific name), Number of specimens landed, Tons landed, Number of specimens discarded (by-catch for mammals reptiles and	06/02/2015	Tender "Growth and Innovation in Ocean Economy – Gaps and Priorities in sea basin observation and data. Lot-2: The Mediterranean"

	seabirds), Ton discarded (by-catch for mammals, reptiles and seabirds)		
Rhiannon Meier National Oceanography Centre European Way, Southampton SO14 3ZH, UK	Effort-by-rectangle	29/01/2015	Unknown
Kristina Boerder Ph.D. student Transatlantic Ocean System Science and Technology (TOSST) Program Wormlab, Dept. of Biology, Dalhousie University Halifax, Canada	Fishing effort regarding European waters and fleets with focus on spatial data	14/11/2014	Unknown
Isabelle GAUTIER Administrator Information Specialist European Parliament European Parliamentary Research Service Structural and Cohesion Policies Unit Directorate Members' Research Service	Statistics about discards by Members States and species or by fishery	17/09/2014	Unknown

Up to mid-October 2008 reports of the STECF were released in the format of Commission Staff Working Documents and afterwards in the format of JRC, Scientific and Technical reports and JRC science and Policy reports containing ISBN, ISSN, doi and EUR identifiers. This format has been chosen to further increase visibility and to further increase dissemination. STECF reports are cited in numerous scientific publications bearing in mind that not all of the reports are utilising the DCF data. Table 6.1.4 below displays the number of STECF reports cited in scientific journal publications.

Table 6.1.4. Number of STECF reports cited in scientific journals from 2002 to April 2015.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Total number of citations	1	1	5	2	4	4	5	12	9	15	20	31	41	12	162

Source: Scopus and Web of Science

Up to now, STECF reports have been cited in 134 papers published in 44 different scientific peer reviewed journals. The top five journals where STECF reports are cited (from 2002 to 2015) are: 1)

ICES Journal of Marine Science (37), 2) Fisheries Research (16), 3) Marine Policy (15), 4) PLoS ONE (9) and 5) Scientia Marina (8).

Furthermore, it is worth to mention that the DCF data is used in many scientific papers, see for instance:

Rebuilding EU fish stocks and fisheries, a process under way? Cardinale, M.; Dörner, H.; Abella, A.; Andersen, J. L.; Casey, J.; Döring, R.; Kirkegaard, E.; Motova, A.; Anderson, J.; Simmonds, E.J.; Stransky, C. Marine Policy, 39 (2013) 43-52.

Modelling fishers' response to discard prevention strategies: the case of the North Sea saithe fishery. Simons, S.L.; Döring, R.; Temming, A. ICES Journal of Marine Science; doi:10.1093/icesjms/fsu229.

Identification of métiers based on economic and biological data: The Spanish bottom otter trawl fleet operating in non-Iberian European waters. Castro, J.; Marín, M.; Pérez, N.; Pierce, G.J.; Punzón; A. Fisheries Research 125–126 (2012) 77–86.

Lessons for fisheries management from the EU cod recovery plan. Kraak, S.B.M.; Bailey, N.; Cardinale, M.; Darby, C.; De Oliveira, J.A.A.; Eero, M.; Graham, N.; Holmes, S.; Jakobsen, T.; Kempf, A.; Kirkegaard, e.; Powell, J.; Scott, R.D.; Simmonds, J.; Ulrich, C.; Vanhee, W.; Vinther, M. Marine Policy 37 (2013) 200–213.

Discards and discarding practices in German fisheries in the North Sea and Northeast Atlantic during 2002–2008. Ulleweit J.; Stransky, C.; Panten, K. Journal of Applied Ichthyology 26 (Suppl. 1) (2010), 54–66.

Economic effort management in multispecies fisheries: the FcubEcon model. Hoff, A.G.; Frost, H.S.; Ulrich, C.; Damalas, D.; Maracelias, C. D.; Goti, L.; Santurtun, M. ICES Journal of Marine Science 67(8) (2010) 1802-1810.

Finally, the DCF data referred to various websites including for instance:

- http://www.fisheriesmodel.org
- http://www.displace-project.org/wiki/index.php?title=DISPLACE

6.2. Report on the DCF workshop on transversal variables

Background

For a number of years, scientists have struggled to provide integrated bio-economic advice for European Fisheries because of the inability to link fleet-specific biological and economic data collected under the EU data collection frameworks (DCR, DCF). The need to progress this issue and find a solution was again raised by the Planning Group on Economic Issues (PGECON) at its 3rd meeting (May 31 - April 4, 2014) and proposed that an ad-hoc workshop on "Linking economic and biological effort data /call design" be convened.

The need for such a workshop was due to the increasing need to have access to economic and biological data at a level of disaggregation that would allow full interoperability between the datasets. Several management plans are stock-specific and require economic information on the vessels that exploit that specific stock. This level of information is generally not available at the EU level because DCF economic data are reported by fleet segment and fleets generally exploit a range stocks and often across different management areas. Impact assessments and evaluation of

management plans are other examples for which economic data are required at relatively high resolution (disaggregation).

Furthermore, DG MARE addressed PGECON to discuss the feasible content (and timing) of the new data calls. Up to now, the annual call for economic data on the EU fishing fleet has remained relatively standardised in terms of content and timing, with minor changes year to year, but continues to not always fit into the metier resolution that is needed to support the evaluation of management plans. If more detailed data calls are to be launched to cater for such evaluations, it is necessary to determine what is needed (variables, format, level of disaggregation) and when it is feasible to make such requests.

The proposal for the workshop was therefore welcomed by DG MARE and the Croatian Government offered to convene the meeting in the premises of the Ministry of Agriculture. Accordingly, a Workshop on Transversal Variables took place in Zagreb from the 19th to 23rd of January 2015, mainly to tackle the issues related to the increasing need of having fisheries fleet economic and fisheries biological data at a level of disaggregation that would allow interoperability between datasets to underpin bioeconomic modelling.

Request to the STECF

STECF is requested to review the report of the DCF workshop, evaluate the findings and make any appropriate comments and recommendations i.e. in relation to the formulation of future data calls issued by the Commission in support to STECF and possible implications for maintenance and further developments of the associated databases.

To facilitate the STECF review, the Chair of the Workshop, Cristina Ribeiro (JRC) was invited to present the report of the workshop to the plenary meeting of the STECF and to discuss the findings and proposals arising.

STECF observations

STECF welcomed the opportunity to review and comment on the report of the Zagreb Workshop on transversal variables noting the considerable work undertaken and comprehensive nature of the report. There is an increasing need for the STECF to have regular access to fleet-specific economic and biologic data at a level of disaggregation that will allow full interoperability between the datasets in order to undertake bioeconomic modelling and provide informed advice to the Commission on the CFP. In particular there is a need to reconcile the differences in disaggregation of fleet-specific data assembled in response to the Annual data calls issued under the Data collection framework (DCF).

In undertaking its work the workshop addressed a number of issues:
A) Comparison of economic and biological effort data calls to check for consistency in resolution, accuracy, level of aggregation, content and to draw on experiences gained by experts involved in the evaluation and assessment of management plans.
B) Definition of variables in the different data calls and to determine what is really required/used/desirable (e.g. days at sea vs. fishing days).
C) Opportunities for harmonisation between data requested in different data calls in terms of resolution, definition, codification and whether there are any implications for the DCMAP.

D) Exploration of optimum timing for future data calls and specific data sets.

STECF notes that all of the above issues were comprehensively addressed and that the findings and proposals in the report provide the basis for achieving fishery-dependent biological and economic data at a common level of aggregation suitable to undertake bioeconomic modelling

STECF conclusions

Based on the report and the presentation by the Chair of the Workshop on Transverse variables held in Zagreb from 19th to 23rd of January, 2015, STECF concludes that if all parties involved in future DCF data calls, act on the findings and proposals of the workshop, the data bases required to undertake bioeconomic modelling of the EU fisheries will be significantly enhanced and should lead to a situation where data that are provided only once, can be used for multiple purposes (so called "one provision several uses"). To this end STECF notes that there is still a need for data users and Member States to collaborate to further improve the quality and consistency of the data provided under DCF data calls.

The STECF concludes that the workshop proposal regarding standardisation of methods to calculate transversal variables, and in particular fishing effort should be fully supported and work should be carried out so that the 2016 data calls can already benefit from these outcomes and that clear guidance is given to the MS to ensure that the data submitted by Member States in response to future data calls is consistent and coherent data. Furthermore STECF agrees that it is desirable to hold a technical workshop to decide on the most appropriate metrics for fishing effort for passive gears and vessels not required to complete logbooks, so as to identify together with Member States any particular issues that still need to be clarified ahead of the 2016 data calls. The workshop should also identify the information needed and methods to calculate the effort metrics and evaluate to what extent the information identified is available through logbooks and other official statistics. STECF further notes that whatever metrics are chosen, it is vital that historical time series of such metrics are re-constructed to inform on the past developments in fishing effort and fleet performance using a consistent data set. STECF also recognises, that reconstruction of such time series may give rise to results that differ from those that have already been undertaken using existing time series of data

STECF suggests that the Commission consider the most appropriate way to convene such a workshop according to the timescale proposed in the workshop report. STECF also suggests that the JRC should be intimately involved in the workshop as the JRC has responsibility for screening of data from data calls and maintenance of the databases.

Furthermore STECF recognises the growing need for a DCF "quality assurance reference framework" for use by Member States, which should include *inter alia* a suite of standard methodologies, which prescribe how to calculate, encode and aggregate fisheries data so that they can be integrated to form a coherent EU dataset and which can serve to support DCF data end-users. STECF considers that that the development of such a framework is fully in line with the Marine Knowledge initiative and should be steered by the Commission.

7. STECF RECOMMENDATIONS FROM STECF-PLEN-15-01

No new recommendations arose during discussions at the 48th plenary meeting of the STECF.

8. CONTACT DETAILS OF STECF MEMBERS AND OTHER PARTICIPANTS

[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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