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SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES – 50th PLENARY MEETING REPORT (PLEN-15-03)

PLENARY MEETING,
9-13 November 2015, Brussels

Edited by Norman Graham & Hendrik Doerner

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Abstract

The Scientific, Technical and Economic Committee for Fisheries hold its 50th plenary on 9-13 November 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 the Mediterranean stock assessments, the landing obligations, and fisheries management plans.

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PLENARY MEETING

9-13 NOVEMBER 2015, BRUSSELS

1. INTRODUCTION

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

2. LIST OF PARTICIPANTS

The meeting was attended by 23 members of the STECF, three invited experts and four JRC personnel. Nine Directorate General Maritime Affairs and Fisheries (DG MARE) attended parts of the meeting. Section nine of 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:
Alyne Delaney
Simon Jennings
Andrew Kenny
Sakari Kuikka
Hilario Murua
Jenny Nord
Francois Theret
Willy Vanhee

3. INFORMATION TO THE COMMITTEE

3.1. STECF plenary – information from the Commission - TAC adjustments for stocks under the landing obligation

The Commission informed the STECF that ToR 6.5 on potential TAC adjustments for stocks under the landing obligation would need to be treated with highest priority. The Commission requested the STECF to provide its advice on this subject by the end week of the plenary meeting if possible. This advice would thus been published as a stand-alone opinion/report of the STECF prior to the plenary report.

3.2. STECF plenary – information from the Commission – Commission Decision on new STECF and selection of new committee

The Commission informed the STECF that following the reform of the CFP[1] and the start of the new Commission a new Commission Decision on STECF has been drafted and commented in Commission inter-service consultation. The new Decision can be expected to be published in the coming months. The new Decision on STECF will provide the legal basis for the appointment of the new STECF.

4. STECF INITIATIVES

4.1. Addendum to sea bass advice in PLEN 14-02

STECF notes an error in PLEN 14-02 where the proportions of sea bass catches taken in target and non-target fisheries were inappropriately assigned.

Generally, 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 34% (mid-water pair trawls and lines) and; other commercial fisheries account for 40% of the overall catch.

According to ICES (ICES 2014) and as reported in the sea bass 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 35% of the total commercial landings and are responsible for around 25% of the total (commercial and recreational combined) fishing mortality (i.e. total F (5-11) = 0.325) estimated by WGCSE 2014 for the years 2011 - 2013. Other commercial fisheries are lines fisheries mainly from France and UK, amounting to 11% of the total commercial catch respectively. The remaining commercial catches (54%) are attributed to a

1 Regulation (EU) No 1380/2013, OJ L354, 28.12.2013, p.22

mix of other (nets and trawls) or unspecified gear. STECF notes that with the exception of pelagic midwater trawl fishery and line fisheries, the current catch statistics are of an insufficient granularity to categorise bass as being either caught in targeted or non-target fisheries.

5. ASSESSMENT OF STECF EWG REPORTS

5.1. EWG 15-11: Mediterranean assessments - Part 1

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.

Observations of the STECF
The meeting was held in Palma de Mallorca, Spain, from 31 Aug - 4 Sep 2015 and hosted by the Centro Oceanográfico de Baleares - Instituto Español de Oceanografía. It was the first of the STECF expert meetings, within STECF's 2015 work programme, planned to undertake stock assessments in the Mediterranean Sea. The meeting was chaired by Massimiliano Cardinale and attended by 22 experts, including 4 STECF members. Furthermore, two JRC experts and one DG MARE representative were also present. Data of historical fisheries and scientific surveys derived from the official Mediterranean DCF data call issued to Member States on April 2015 with deadline on 2nd of July 2015 and 'operational deadline' on 17th of August.

The terms of reference for EWG-15-11of the meeting were:

For the 15 stocks given in Table 4.1.1, the STECF-EWG 15-11 is requested to:
ToR 1 – Assess trends in historic and recent stock parameters for the longest time series possible available up to and including 2014, for the stocks proposed in the Table below. This shall cover the evaluation of the level of fishing mortality at age, spawning stock biomass, stock biomass, and recruits at age. Data on fishing effort shall be provided by fleet segments and shall be the most detailed possible to support the establishment of a fishing effort or capacity baseline. Different assessment models should be applied as appropriate, including analyses of retrospective effects.

List of proposed stocks

Nb	Geographical Sub-Areas	Common name	Scientific name	Priority
1	GSA 1	Hake	*Merluccius merluccius*	High
2	GSA 5	Hake	*Merluccius merluccius*	High
3	GSA 6	Hake	*Merluccius merluccius*	High
4	GSA 7	Hake	*Merluccius merluccius*	High

5	GSA 8[2]	Hake	*Merluccius merluccius*	High
6	GSA 9	Hake	*Merluccius merluccius*	High
7	GSA 10	Hake	*Merluccius merluccius*	High
8	GSA 11	Hake	*Merluccius merluccius*	High
9	GSAs 1-7	Hake	*Merluccius merluccius*	High
10	GSAs 8-11	Hake	*Merluccius merluccius*	High
11	GSA 9	Giant red shrimp	*Aristaeomorpha foliacea*	Medium
12	GSA 10	Giant red shrimp	*Aristaeomorpha foliacea*	Medium
13	GSA 11	Giant red shrimp	*Aristaeomorpha foliacea*	Medium
14	GSA 6	Blue and red shrimp	*Aristeus antennatus*	High
15	GSA 1	Blue and red shrimp	*Aristeus antennatus*	High

In case it is not possible to carry out an evaluation of those stocks listed in table 4.1.1, is provided a reserve list of stocks

ToR 2 – Propose and evaluate candidate MSY value or range of values and safeguard points in terms of fishing mortality and stock biomass. The proposed values shall be related to long-term high yields and low risk of stock/fishery collapse and ensure that the exploitation levels restore and maintain marine biological resources at least at levels which can produce the maximum sustainable yield.

ToR 3 – Provide short and medium term forecasts of spawning stock biomass, stock biomass and catches. The forecasts shall include different management scenarios, inter alia: zero catch, the status quo fishing mortality, and target to F_{MSY} or other appropriate proxy by 2018 and 2020. In particular, predict:

i) The level of fishing mortality which minimize the risk of SSB falling below B_{lim} with a 5% probability and provide MSY or maximize the total yield from the stock in the long term; and

ii) The level of fishing effort exerted by different fleet segments which is commensurate to the sustainable short-term and medium-term forecasts of the proposed changes.

ToR 4 – On the basis of the existing information, prepare and/or up-date maps showing areas and periods with high occurrence of juveniles and/or spawners of *Merluccius merluccius*, *Aristeus antennatus* and *Aristaeomorpha foliacea*.

ToR 5 – Provide a synoptic overview of: (i) the fishery; (ii) the most recent state of the stock (spawning stock biomass, stock biomass, recruits, and, if possible, exploitation level by fleet segment); (iii) the source of data and methods and; (iv) the management advice, including MSY value or range of values and safeguard points.

ToR 6 - Summarize and concisely describe all data quality deficiencies, including possible limitations with the surveys, of relevance for the assessment of stocks and fisheries. Such

2 *Although a full analytical assessment may not be possible to perform for hake in GSA 8, the EWG is requested to provide a preliminary analysis with some elements such as the level of fishing mortality, fishing effort, CPUE or survey indexes, even if the time series are limited.*

review and description are to be based on the data format of the official DCF data calls for the Mediterranean Sea issued on April 2015.

STECF comments

Based on the findings in the EWG-14-19 report, STECF observes that the EWG 15-11 undertook the stock assessment of 15 stocks. Mediterranean hake was assessed in the individual GFCM GSAs 1, 5, 6, 7, 8, 9, 10, 11 and jointly for GSA 1, 5, 6, 7 and 9, 10, 11. Giant red shrimp was assessed in GSA 9, 10, 11 and Blue and red shrimp in GSA 1 and 6.
For 1 stock (Hake in GSA 8), the assessment was conducted but not accepted due to insufficient length data being available. STECF notes that hake only constitute ~2% of total demersal landings in GSA8.

A total of 13 out of 14 stocks for which assessment was accepted were classified as exploited unsustainably with the exception of Giant red shrimp in GSA 9 (see Table 5.1-1 for details).
STECF notes that partial fishing mortality by fleet is presented for the main fisheries that exploit each single stock in the area. There were also estimated ranges for F_{MSY} based on empirical relationship for F0.1 based on information of stocks of ICES area.

Table 5.1-1 Synoptic table of the stock assessed during EWG 15-11. In red are stocks for which current F is larger than F_{MSY}.

Stock area	Common name	Assessment	F*	F trawlers**	F trawlers**	F gillnets**	F trammel**	F longlines	F_{MSY}	F_{MSY} range	F/F_{MSY}	B_{lim}	B_{curr}	B/B_{lim}	Short term
GSA 1	Hake	XSA	1.20	0.91		0.05		0.11	0.21	0.14-0.29	5.71	220	220	1.00	Yes
GSA 5	Hake	XSA	1.12						0.15	0.10-0.21	7.47	31	75	2.41	Yes
GSA 6	Hake	XSA	1.39	1.62		0.10[¤]			0.26	0.17-0.36	5.35	1533	1599	1.04	Yes
GSA 7	Hake	XSA	1.64	1.40[?]	0.16[??]	0.17		0.03	0.11	0.08-0.16	14.91	769	1115	1.45	Yes
GSA 8	Hake	Surba					**not accepted**								
GSA 9	Hake	XSA	1.03	0.77		0.15	0.03		0.23	0.16-0.32	4.48	1569	2197	1.40	Yes
GSA 10	Hake	XSA	1.10	0.26		0.44		0.21	0.20	0.13-0.27	5.56	967	1635	1.69	Yes
GSA 11	Hake	XSA	1.60						0.17	0.11-0.24	9.41	73	73	1.00	Yes
GSAs 1_7	Hake	XSA	1.40	1.03		0.07		0.05[¦]	0.39	0.26-0.53	3.59	5186	8133	1.57	Yes
GSAs 9_11	Hake	XSA	1.10	0.50		0.10	0.24	0.12	0.20	0.14-0.28	5.50	2355	2912	1.24	Yes
GSA 9	Giant red shrimp	XSA	0.13						0.51	0.34-0.69	0.25	80	94	1.18	Yes
GSA 10	Giant red shrimp	XSA	0.91	0.50		0.01			0.65	0.43-0.88	1.40	265	265	1.00	Yes
GSA 11	Giant red shrimp	XSA	0.50						0.31	0.21-0.43	1.61	26	46	1.77	Yes
GSA 1	Blue and red shrimp	XSA	1.40						0.41	0.27-0.56	3.41	224	322	1.44	Yes
GSA 6	Blue and red shrimp	XSA	0.75						0.36	0.24-0.49	2.08	1287	3848	2.99	Yes

*Last year
**Average of the last 3 years
[?] French trawlers
[??] Spanish trawlers
[¤]Gillnet and longliners
[¦] Longliners also included other gears
***Probability of SSB to fall below Blim

STECF notes that for hake in GSA7 and GSA 11, very high F/F_{MSY} ratios were estimated (F/F_{MSY} >> 5~15). No explanations as to why the ratios are so high (besides assuming that these are correctly estimated by the assessment model) are given in the report but it is possible that the high ratios are due to inappropriate stock boundary definitions. Current GSAs boundaries may be not necessarily encompass the entire stock, which may in fact be spread across more than one GSA. The results of the assessments conducted over wider areas (i.e. GSAs 1, 5, 6, and 7 combined and GSAs 9, 10 and 11 combined for hake) have shown lower F/F_{MSY} ratios compared to the single GSAs (Table 5.1-1), and may partially explain the very high ratios observed in some of the single GSA assessments e.g. Hake in GSA7. While the

high F/F_{MSY} rations could also be influenced by other factors such as data quality or assumptions in the assessment models, (i.e. constrained selection pattern, growth parameters, mortality at age, etc.), STECF notes that the ratios of F/F_{MSY} for the GSA combined assessments for hake are still very high, 3.59 and 5.5 for GSAs 1_7 and GSAa 9_11, respectively meaning that these stocks are heavily overexploited irrespective of stock boundary assumptions.

STECF notes that EWG 15-11 prepared or up-dated maps showing areas and periods with high occurrence of juveniles and/or spawners of *Merluccius merluccius*, *Aristeus antennatus* and *Aristaeomorpha foliacea*. The TOR was addressed by creating new maps using MEDITS data showing the main concentrations of juveniles and adults. STECF notes the intrinsic limitations of the distribution maps when trying to infer spatial distribution of these species. MEDITS surveys are conducted only in late spring-summer and are therefore unlikely to be representative of the spatial distributions at other times of the year.

STECF also notes that in fulfilment of TOR (6), stock specific evaluations of the data quality were conducted for all stocks requested under ToR (1-5) by the experts. Deficient DCF data were observed for Hake for GSA 8 (i.e. Corsica), and no MEDITS data for Italian GSA 17 prior to 2002 were available. However, STECF acknowledges that hake catches in GSA 7 are typically only 2% of total demersal catches.

STECF notes that stock-specific evaluations of the data quality were conducted for all stocks requested under ToR (1-5) by the experts and endorses the main findings. STECF notes that some unresolved issues remain, in particular relating to data quality and delays in data submission.

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

5.2. EWG 15-14: Landing Obligation - Part 6

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. In making their evaluation STECF is asked to take into account any additional supporting information they may be supplied by the Member States Regional Groups.

Observations of the STECF
STECF observes and acknowledges the work undertaken by the EWG chair and experts to produce the report of EWG 15-14, Landing Obligation Part 6. STECF observes that, due to difficulties arising from inaccurate and incomplete data relating to Mediterranean fisheries, TOR1, identifying and describing the main demersal fisheries, took most of the time available to the EWG. This difficulty prevented the full completion of other TORs.
STECF observes that a list describing the main demersal fisheries with species subject to minimum landing sizes is provided; defining the fishery through area, gear used and target species. TOR1 is fully addressed in section 2 of the EWG report.

Phasing in, at 2017 and 2019, of species to be subject to the landing obligation is to be done according to whether they are the species that define the fisheries or not. This implementation could mean that in the same marine region, and possibly using the same gear, two vessels could be considered to be engaged in different fisheries, depending on their target species. Then, between 2017 and 2019, one crew will be obliged to retain their target species and the other crew could discard the same species, if it is not defined as their target species. STECF observes that it may be much more simple and achievable to phase species into the landing obligation in 2017 according only to marine geographical area or species, rather than by fisheries, however defined.

STECF observes that TOR2 was not addressed by the EWG 15-14 because it could find no information on approaches used by MS to identify species that define fisheries in the Mediterranean Sea.

STECF observes that TOR3 is addressed in section 3 of the EWG 15-14 report which includes a review of available survival information. However, there is little or no literature or evidence available on survivability after discarding in the Mediterranean. Survival rates from studies in other sea areas cannot be directly applied to Mediterranean fisheries as gear characteristics, fishing techniques, sorting on the deck, and environmental conditions are not comparable between sea areas.

STECF observes that, in response to TOR4, the EWG 15-14 report contains a review of technical measures and their effectiveness in improving selectivity in Mediterranean fisheries. STECF considers that the best option to improve selectivity in the area is a combination of various technical measures used together with dynamic spatial and seasonal restrictions on fishing, as well as permanent restrictions on fishing in nursery areas. The ideal combination of measures depends on area, species, catch composition and "other factors".

STECF observes that, due to time restrictions, EWG 15-11 did not provide a specified list of the most effective measures for various species, areas or circumstances, and that such a list might be helpful for policy makers.

STECF observes that TOR5 was not fully addressed because fisheries were identified only at the end of the meeting. There is some discussion of the issue that although the legal requirement to discard fish will be removed once the landing obligation is implemented, the economic incentive to discard would remain, unless the vessel operators perceive a high likelihood of having to pay a fine that would exceed their losses or costs incurred from observing the landing obligation arising from retaining and landing unwanted fish.

STECF observes that since TOR1 has been fully addressed, it would now be possible to more fully address TOR5, namely, to identify discard issues that cannot be addressed through improved selectivity or which would create disproportionate costs of sorting unwanted catches on board. However, as mentioned in a previous STECF report (STECF 13-23, https://stecf.jrc.ec.europa.eu/reports/discards), STECF can only advise likely broad levels of costs of handling as a proportion of the sales value of the fish. There is no scientific definition of "disproportionate" in this context and therefore it would be the role of policy makers to decide at which level such a threshold should be set. In this context, STECF agrees it is necessary to identify potential indicators to evaluate the landing obligation and to assess the

performance of individual regional discard plans. This is an important issue that should be considered within regional discard plans and work should progress on this aspect.

Conclusions of the STECF

STECF concludes that the EWG 15-14 report represents an important step in identifying and assessing some of the key issues associated with the landing obligations in the Mediterranean Sea.

STECF concludes that, in order to utilise the exemption relating to high survivability of discarded fish, it will be necessary to conduct research and develop appropriate evidence on post-discard survival rates.

STECF concludes that it would be simpler and more realistic to implement the phased approach to bringing species under the landing obligation according to marine geographical area or species rather than according to the species that define the fisheries.

The landing obligation stipulates the progressive elimination of discards of species subject to catch limits and, in the Mediterranean Sea, catches of species subject to minimum sizes as defined in Annex III of Regulation (EC) No 1967/2006 (MEDREG). STECF concludes that, in order to monitor the development of the discards ban, the data collection (landings and discards) for all species included in the MEDREG, should be added to the MS National Programmes.

STECF concludes that further exploration as to the utility of different technical measures in the context of achieving the objectives of the CFP in Mediterranean fisheries is warranted, for example through a dedicated EWG. Specifically, this should aim to evaluate the biological and economic impact of changing selectivity through adjustments in technical regulations and to identify what can be achieved by TCMs regarding the broader objectives of the CFP including the achievement of MSY objectives and the landing obligation.

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

6.1. Mediterranean Swordfish Stock assessment

Background

Commission for the Conservation of Atlantic Tunas (ICCAT). ICCAT Standing Committee on Research and Statistics (SCRS) releases periodically a scientific advice on the status of the stocks and associated management recommendation. Currently, the management of the stock is subject to the provisions contained within ICCAT Recommendation 13-04. The provisions include technical measures, such as among others two closure periods (two months in Oct-Nov and one month in the spring Feb-March), minimum size, maximum number of hooks, and minimum hook size.

The latest stock assessment for MED SWO took place in July 2014. The SCRS MED-SWO working group considered the use of an age structure model to provide the most reliable assessment. This model estimated that the SSB is currently 65% lower than SSB_{MSY} and that F is about twice the F_{MSY}. However the group also noted that these results have significant uncertainty. The data used for these models included information from Task I and Task II data, up to and including 2013. Unfortunately, the data from EU-Italy (the main catching party) for 2013 was not accurate as the catches reported were only estimated and turned out to be significantly higher (100%) than the actual catches.

The SCRS MED SWO working group concluded that the biomass of the stock has been stable over the last twenty years and that fishing mortality is declining since 2010. The group also highlighted that catches of juveniles are declining and that this is linked to the seasonal closures and to a shift towards mesopelagic gears. This shift towards mesopelagic rather than pelagic longlines is a noteworthy feature of the recent evolution of the fishery and could have some significant impact on the dynamics and the status of the stock. It is unclear whether the fact that larger fish are being caught in the context on the mesopelagic fishery is a positive development for the stock (less juvenile fish being captured) or if it has a potentially negative impact, by removing a portion of the stock which is made of large mature fish which had been so far relatively protected from exploitation.

The management recommendations advised to maintain the existing management measures and to further evaluate their effects on the stock.

The European Union is the most important stakeholder in this fishery, with more the 80% of the catches coming from EU vessels. This confers a particular responsibility on the EU in ensuring that this stock is managed in a sustainable way, and in accordance with the principles of the Common Fishery Policy. In this context, and despite the recent advice for stability in the management measures, the EU considers that a pro-active approach may be required in order to ensure that the MED SWO stock is exploited at a sustainable level. In this context, conducting an updated stock assessment, on the basis of the corrected 2013 data and updated 2014 data, would help towards filling some of the gaps in our knowledge on this stock and contribute toward the next ICCAT stock assessment exercise scheduled for 2017. In particular, it would be beneficial to assess the effectiveness of the existing technical measures, to develop limit and target reference points and to explore potential new management strategies.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Request to STECF

Through an ad hoc contract, an update of the stock assessment has been carried out as well as evaluation of existing technical measures. STECF is requested to review the report of the ad-hoc contract, evaluate the findings and make any appropriate comments and recommendations.

STECF observations

In addition to the updated assessment, an alternative empirical approach as the basis for fishing mortality and biomass reference points as an alternate to the analytical estimates are also presented in the ad hoc contract. The alternate reference points are based on the historical

time series of SSB and F estimates derived from the assessment with the 90-percentile rate of SSB as a proxy for SSB_{MSY} and the 10-percentile of F a proxy for F_{MSY} with the 50-percentile rates as the corresponding limit reference points.

STECF conclusion

STECF considers that the update assessment of Mediterranean swordfish has been conducted in accordance to the ToRs and applying the same methodology (i.e. XSA model) used by ICCAT to deliver advice in 2014 and the updated catch data (i.e. mainly revision of the Italian data) up to 2013.

STECF notes that the report provides an alternative estimation of the reference points based on an empirical methodology. STECF also notes that this methodology provides a very different estimate for F_{MSY} (F = 0.39) compared with the analytical approach (F = 0.28) used by ICCAT or the one provided in the report using the analytical approach based on stock assessment data.

Given the current level of uncertainty regarding the estimates of F_{MSY}, STECF consider that simulations should be conducted to estimate and test alternative F_{MSY} reference points based on different stock recruit models. Until such time, STECF considers that based on PA considerations, that the current analytical F_{MSY} should be maintained.

STECF notes that the simulations presented show little effects of a change in selectivity associated with the switch from surface to mesopelagic longlining. However, STECF further notes that this is based on a limited dataset. STECF agrees with the conclusions of the report that the period October - January should be preferred for fishery closures to protect juvenile Mediterranean swordfish which would potentially increase future yield. STECF also agrees that fishery prohibition should be extended in the same months to other drifting pelagic such as the longline fishery for albacore, which have important swordfish by-catches.

STECF notes that the reference points used in the report to define the harvest control rules are based on the exploratory empirical approach rather than the current analytical method. STECF concludes that given that the rationale for using these reference points is not adequate (see above), the HCR should be based on the reference points calculated using the analytical approach. Furthermore, STECF considers that, once the reference points and the harvest control rules are defined, a management strategy evaluation should be conducted to check the robustness of them and evaluate if these are in accordance with the MSY framework.

6.2. CFP monitoring

Request to the STECF

STECF is requested to report on progress in achieving MSY objectives in line with CFP.

Background

Article 50 of the Common Fisheries Policy (CFP; Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013) stipulates: “The Commission

shall report annually to the European Parliament and to the Council on the progress on achieving maximum sustainable yield and on the situation of fish stocks, as early as possible following the adoption of the yearly Council Regulation fixing the fishing opportunities available in Union waters and, in certain non-Union waters, to Union vessels."

To facilitate such a report, in October 2014, the Commission requested the STECF to review and advise on suitable metrics and indicators. Based on the STECF Report (STECF 14-23), the Commission requested that an ad hoc Expert Group be convened to develop and calculate a suite of suitable indicators. An ad hoc Expert group was convened and its report was reviewed and adopted by the STECF by written procedure in March 2015 (STECF 15-04).

The STECF 15-04 report provided indicator values for the ICES area only because the information needed to calculate equivalent indicator values for the Mediterranean and Black Seas was not available at that time. Additionally model based indicators suggested by STECF 14-23 to look for overall regional trends in F/F_{MSY}, B/B_{MSY} or SSB were not computed. The model based indicators required further work to evaluate their utility, which was not carried out at the time STECF 15-04 was produced.

Such model based indicators could be useful to deal with two common situations:

1. **Irregular stock assessments** – For the Mediterranean for example, in one year more effort is allocated to assess hake stocks, while in another year the focus is put on small pelagics. In these cases the arithmetic mean of a variable like F/F_{MSY} will blur the regional average and will reflect the differences of the available information in each year. If the information available in a particular year contains more assessments of highly exploited stocks, the arithmetic mean of F/F_{MSY} will be higher, not because on average the regional fisheries pressure increased, but because the dataset included those particular stocks. A model may cope with these differences and better reflect the regional estimates of annual fishing pressure. This situation has a direct impact in indicator 2.e in STECF 15-04, where a model based indicator could **replace** the arithmetic mean of F/F_{MSY}.
2. **Missing management reference points** - Some of the stocks that are assessed do not have reference points because the assessment results were not considered reliable enough to estimate them. The most common reason is a poorly-defined stock-recruitment relationship. Nevertheless, the SSB trends for many stocks are considered sufficiently reliable to evaluate the trends in biomass over time. For such stocks the indicators about safe biological limits (SBL) cannot be computed. This situation has direct impact in indicators 2.c and 2.d in STECF 15-04, where a model based indicator that captures the regional time trend in SSB could be used to complement the SBL indicators.

To make progress on the utilization of model based indicators, Dr C. Minto was contracted to develop and test through simulation, candidate model based indicators to examine trends in F/F_{MSY}, B/B_{MSY} and Biomass over time. The models were tested for stability and sensitivity to

annual changes in data availability, e.g. no yearly updating of all assessments. A report with the work performed was presented to the STECF and is accessible on https://stecf.jrc.ec.europa.eu/plen1503.

In a follow up of the work done by Dr. C. Minto, an application to the Mediterranean stock assessment information was carried out, where the models were applied to real data and the stability of the model based indicators to different time windows was tested and reported to the STECF (Osio *et. al*., https://stecf.jrc.ec.europa.eu/plen1503).

As the Commission is required to report annually to the Council and the Parliament on progress towards achieving CFP objectives, there is a need to develop a standardised procedure to define the sampling frames for the indicators in the different sea areas and prescribe the methodology to calculate them. In view of this JRC Experts also prepared a report for review by the STECF proposing a protocol to be followed to calculate the indicator values and prepare the annual report (WD Jardim *et. al.*, https://stecf.jrc.ec.europa.eu/plen1503).

The work mentioned above was carried out during a technical meeting between JRC experts, Coilin Minto (GMIT) and Kenneth Patterson (DG MARE) that took place between 19th and 21st of October at JRC, Italy.

STECF review

STECF reviewed the following reports with the aim of specifying the methodologies to be used and the protocol to be followed to prepare future annual reports to the Commission on progress towards achieving CFP objectives in order that the Commission can meet its obligations under Article 50 of Regulation (EU) 1380/2013.

- Testing model based indicators for monitoring the CFP. Report prepared under contract to DG Mare by Dr C. Minto
- Model based CFP indicators, F/ F_{MSY} and SSB. Mediterranean region case study. Prepared by Giacomo Chato Osio, Ernesto Jardim, Coilin Minto, Finlay Scott and Kenneth Patterson.
- Common Fisheries Policy monitoring - protocol for computing indicators prepared by JRC Experts E. Jardim, I Mosqueira, G. Chato Osio and F. Scott.

A fourth report reproducing the STECF 15-04 report on CFP indicators for the ICES area but using the proposed new sampling frames was also prepared by the technical meeting but is not reviewed here.

All four reports are available at: https://stecf.jrc.ec.europa.eu/plen1503

STECF observations

STECF considers that agreeing protocols that describe how the CFP monitoring reporting is to be performed will contribute to make the process more transparent. STECF notes that extensions to the protocols proposed below may be needed if and when more indicators are to be reported. Therefore STECF endorses the need for agreed protocols.

Testing model based indicators for monitoring the CFP.

STECF notes that the contractor, Dr C. Minto satisfactorily addressed all of the Terms of Reference in the contract and the report was delivered to time and quality.

A series of simulations were conducted using generalised stocks defined according to life history parameters viz. demersal, small pelagics and large pelagics in order to systematically test the ability of candidate modelling methods to generate indicators that reflected known temporal trends. For each generalised stock 4 types of harvest dynamics (fishing mortality trends) were simulated as follows:

- Constant Fishing mortality over time (Flat F)
- A reduction in fishing mortality over time (1-way down)
- An increase in fishing mortality over time (1-way up)
- A decrease followed by an increase in fishing mortality over time (roller coaster).

The goal behind such simulations was to selectively simulate stocks with particular trends, which can then be used to test the ability of the indicator models to recover the trends when some assessments are missing.

From the simulated stocks a sample was selected at random and used to fit the models and test their performance. Three separate model based indicators were tested:

- M1: Arithmetic mean of the variable by year.
- M2: Linear mixed effects model with random effects by stock and a fixed effect on year
- M3: A General Additive Mixed Model (GAMM) with random effects by stock and a smoother function on year

The tests assessed which model better recovered the trend of the underlying variable, e.g. F/F_{MSY}, through the analysis of mean indicator bias and the capacity to identify a trend on the same direction as the variable.

Additionally, the fits were repeated to different sample sizes to evaluate the effect of the number of stock assessments available.

Model based CFP indicators, F/F_{MSY} and SSB - Mediterranean region case study

This report tested the application of the models suggested above to the Mediterranean. The datasets were extracted from the relevant databases and the analysis was implemented to compute the model based indicators for the Mediterranean. It's important to keep in mind that

this was an exercise and does not constitute a preliminary analysis of the CFP implementation in the Mediterranean.

A fourth model was included that modelled the random effects differently.

- M4: A General Additive Mixed Model (GAMM) with two random effects by species and GSA, and a smoother function on year.

The report also included an additional test to evaluate the stability of the model based indicators changes in the time window of data available.

Common Fisheries Policy monitoring - protocol for computing indicators

The protocol report describes how to compute the indicators and how those should be presented in the report. The initial proposal highlights that the two sets of indicators, those to assess management performance and those to monitor advice coverage, require different lists of stocks and expanded on the differences between the two. Additionally, the protocol introduces a set of rules to deal with updates of the stocks' list, which are expected to occur when stock units are merged or split. Finally, the protocol advocates that all the work carried out to monitor the CFP should be published online, including the datasets and the code to run the analysis.

Main findings

Model-based indicators for F and SSB

The simulations and application undertaken focussed on the ability of model based indicators to give stable estimates of the mean value for F/F_{MSY} and SSB. This was done in order to be able to provide a reliable estimate of the trends towards achieving CFP objectives. While it would be desirable to compute an indicator for SSB/SSB_{MSY}, for the vast majority of stocks in the Mediterranean and for many stocks in the Atlantic, biomass reference points are not available, so attempts were made to look at the utility of model-based indicators to detect trends in SSB only.

The STECF conclusions with respect to each of these indicators F/F_{MSY} and SSB are given below.

Annual mean value for F/F_{MSY}

Of the models tested for stability in estimating the time-series trends in the annual mean value for $F/F_{MSY,}$ the linear mixed effects model (M2) with random effects by stock performed best in terms of stability. STECF therefore endorses the use of M2 for estimating time-series trends in F/F_{MSY} for monitoring the performance of the CFP for stocks in FAO Regions 27 (Northeast Atlantic and adjacent Seas) and 37 (Mediterranean and Black seas).

Trends in SSB

Results of simulations indicated that the models tested didn't perform sufficiently well to reliably reflect overall regional trends in SSB. The models that estimate the annual means (M1, M2) are not very useful detecting the overall trend, due to the inter-annual variability of SSB. While the GAM models were not flexible enough and didn't detect short range variability. Consequently, with the data and information currently available a reliable indicator for trends in stock biomass cannot be computed. STECF therefore considers that model-based indicators for regional trends in SSB should not be calculated as the resulting values are likely to be uninformative and potentially misleading for CFP monitoring purposes.

Nevertheless, developing appropriate and reliable model based indicator to monitor trends in SSB is still needed, although it may become redundant as work is on-going to develop biomass reference points for those stocks.

List of stocks

After considerable debate on the above, STECF concluded that it would be preferable to adopt a single list of stocks on which to base both indicators of management performance and advice coverage. However, because of the differences in the nature and availability of data and information available in different regions, it would be appropriate to adopt region-specific lists of stocks. Accordingly STECF proposes the following protocols to define regional stocks' lists.

Region 27 – Northeast Atlantic and neighbouring Seas

STECF considers that for CFP monitoring purposes in Region 27, the list of stocks that will be included in the dataset to compute indicators, should comprise all stocks to which the landing obligation will apply, i.e. all stocks subject to a TAC. Such an approach has the advantage that the list of stocks will remain relatively stable and will incorporate all stocks that are subject to management under the CFP. However, there may be instances where this list needs to be updated because of changes in stock assessments and advice e.g. combining separate stock assessments into a single assessment or providing separate assessments for stocks that were previously assessed together. The protocol of dealing with such changes is given below.

Region 37 – Mediterranean and Black Seas

STECF note that the utilization of model based indicators in the Mediterranean and Black Seas will be facilitated in the future by the ongoing process of redefining stock unit, with several GSA being merged in one stock, and by the increasing number of stocks for which biomass reference points will be estimated.

STECF considers that for CFP monitoring purposes in Region 37, the list of stocks that will be included in the dataset to compute indicators, should comprise all stocks to which the landing obligation will apply, i.e. all stocks subject to a minimum conservation reference size.

Such an approach has the advantage that although large, the sampling frame will remain relatively stable and will incorporate all stocks that are subject to management under the CFP. However, there may be instances where the sampling frame needs to be updated because of

changes in stock assessments and advice e.g. combining separate stock assessments into a single assessment or providing separate assessments for stocks that were previously assessed together. The protocol of dealing with such changes is given below.

Protocol to update lists of stocks.

Due to changes in scientific knowledge, mostly related with spatial boundaries of stock units, the lists of stocks may need to be adjusted in the future. Such changes could have an impact on the quantification of the effects of the implementation of the CFP, although they should not unduly affect the overall perspective of trends in indicators.

STECF proposes that the following rules for updating stocks' lists be adopted for future CFP monitoring reports.

1. The updates consider the stock units existing in the reporting year. Exploratory assessments or assessments not yet approved by the advisory bodies are not considered.
2. When several stocks are merged in a single stock, the individual stocks must be removed from the list and the new stock added.
3. When a stock is split in two (or more), the aggregated stock must be removed and the new ones added to the list.
4. Stocks that cross regions will be allocated to the region where most of the biomass exists.

Finally, STECF agrees that that all the work carried out to monitor the CFP should be published online, including the datasets and the code to run the analyses.

6.3. TAC delegated to FR on Guyana shrimp

Background

Article 6[3] of Regulation 2015/104 setting the fishing opportunities for certain stocks in Union waters provides for certain TAC levels to be determined to Member States. According to the Regulation, *'the TACs to be determined by a Member State shall: (a) be consistent with the principles and rules of the Common Fisheries Policy, in particular the principle of sustainable exploitation of the stock; and (b) result: (i) if analytical assessments are available, in the exploitation of the stock consistent with maximum sustainable yield from 2015 onwards, with as high a probability as possible; (ii) if analytical assessments are unavailable or incomplete, in the exploitation of the stock consistent with the precautionary approach to fisheries management.'*
The TAC setting for the 'Penaeus' shrimp stocks in Guyana waters (*Farfantepenaeus subtilis* and *F. brasiliensis*) has been delegated to France since 2011. For 2015, France set a TAC of 2,170t (down 30% from 2014) while IFREMER reports catches of 732t.

The Commission notes that:

3 http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R0104&from=EN

- the TAC is not allocated *'as is the case for other stocks with low fishing activity'* (as reported by the FR authorities)
- France has set up management measures: i) reducing the number of licenses (40 in 2011, 31 in 2014, 27 in 2015 of which only 15 were allocated), ii) mandating the use of a Trash and Turtle Excluder Device (TTED) for licensees,
- licenses can only be attributed to vessels with horse power 368 kW (500 CV) or less, and
- by-catch of those 2 shrimp species is allowed within a limit of 15% of overall catch for vessels not holding a license.

The Commission also notes the following points in IFREMER report (2015):
- *'Shrimps recruitment is currently at historically low levels (...) this situation is set to continue'.*
- *'The results of this analysis indicate fishing mortality levels in excess of the optimum based on MSY. This suggests the resource is overexploited. The assessment indicates that the overexploitation has worsened in 2013.'*
- *'Landings do not decrease in the same fashion as the stock and even increase in 2014; this results in increased fishing mortality.'*
- *'However fishing does not appear to be the main cause for the stock collapse, recent TAC levels are not commensurate to the stock's productivity. However the TAC was reduced 6.5% in 2014, it is still well in excess of landings.'*
- *'The TAC level never constrained the landings since the end of the 1990s. If it is not set to levels close to recent landings, this management mode may not limit catches.'*
- *'The current TAC level (2014) is not adequate. A considerable reduction is necessary to reduce the likelihood of stock collapse below levels allowing exploitation.'*
- *'The recommendation for a TAC decrease arises from the risk the stock may bear if factors others than increased biomass led to increased profitability. In such case, catches may become too large in comparison to the stock's possibilities.'*

Finally, the Commission notes that the STECF addressed this fishery during PLEN 12-03[4] and concluded the following:
- *'The shrimp stock (Farfantepenaeus subtilis) continues to decline since the mid-2000s despite a declining long-term trend in fishing mortality from 2005. This suggests that fishing is not the main cause of the collapse of the stock biomass and recruitment.'*
- *'The TAC for the shrimp fishery has rarely been achieved in recent years and it has been shown that the conditions of profitability trigger regulation of the fishery before the TAC is reached.'*
- *'To give the shrimp stock a chance to improve, if conditions again become favourable, it may be desirable to consider a revision of the TAC, and consequences of the licenses to ensure that the catches remain moderate to ensure a sustainable renewal of the stock.'*

Request to the STECF
The STECF is requested to review the reports presented by IFREMER for 2014 and 2015 and determine whether the TAC level set by France for 2015 is consistent with Article 6 of Regulation 2015/104 (see background above), the precautionary approach being defined in the 'General context for ICES advice' for 20155, in particular Chapter 1.2.5.

4 http://stecf.jrc.ec.europa.eu/documents/43805/465032/2012-11_PLEN+12-03_JRC76701.pdf
5 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/General_context_of_ICES_advice_2015.pdf

If the data available do not allow such assessment, the STECF is requested to determine whether the catches of these 2 shrimp species are sustainable, based on the historic catches. Lastly, if the response of STECF is negative, it is requested to propose a TAC level in line with Article 6 of Regulation 2015/104.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

STECF comments

The TAC set by France refers to two species, the brown shrimp *Farfantepenaeus subtilis* and the pink shrimp *Farfantepenaeus brasiliensis*. According to Lampert (2011), *F. subtilis* represents 83 % of the catch. The stock status of the brown has been assessed by IFREMER, which assumes that brown shrimps from the French Guyana EEZ can be considered as a unit stock. Monthly catches at age by sex were estimated over the 1989-2014 period from catches at length, using a slicing approach (Lampert 2011). A VPA was conducted by sex, on the monthly basis, and yield and biomass per recruit were estimated. Little information is provided in IFREMER's reports regarding the methods used, especially to fit the VPA to allow STECF to assess the robustness of the results from the VPA.

Notwithstanding the comments above, the stock assessment of the brown shrimp shows that SSB has decreased from about 900t in the 1990s to less than 200t in the most recent years, while mean monthly recruitment has dropped from more than 25 million individuals over the 1990-2007 period to an historical low level of 7 million in 2008-2013. The IFREMER report states that this decrease has been mainly driven by environmental changes, especially characterized by an increase in sea surface temperature (SST), a decrease in Chlorophyll-a concentration and changes in coastal currents (Lampert 2011 and 2013, Magraoui *et al*. 2014). While acknowledging that environmental changes, including those related to climate change, may have effects on recruitment, STECF notes that no evidence has been provided which demonstrates that no recruitment overfishing has occurred for this stock. In particular, Figure 8.5 in Lampert 2011 and Figure 3 in Magraoui *et al*. 2014 suggest a clear pattern, with the lowest recruitments observed for the recent low values in SSB. Thus, STECF considers that the possibility of a synergistic effect of both environmental changes and recruitment overfishing should be further investigated.

Stock assessment also shows that the fishing mortality has remained at a high level since the early 1990s (Higher than F = 0.5 month^{-1}, i.e. F = 6 year^{-1}) and has increased over the last four years, while the nominal fishing effort (expressed in hours at sea) has dropped by a factor of ten over the whole period, with a slight increase in the most recent year of the time series (2014). Yield per recruit analyses suggest significant overfishing, with the current ratio of F/F_{MAX} equal to about 2.5 for females and 3.0 for males.

STECF underlines that neither the measures implemented to reduce fishing effort (especially the reduction of the number of licenses, from 40 in 2011 to 31 in 2014, which is the last year of the assessment), nor any economic regulation (leading to the decrease in the number of boats), appear to have been sufficient to reduce the fishing mortality and avoid overfishing. Thus, STECF considers that there is an urgent need to introduce a restrictive TAC in order to control catches and reduce fishing mortality to the F_{MSY} target (or the F0.1 as a proxy of F_{MSY}).

The IFREMER report notes that previous TACs set over the past 20 years have never been restrictive. For 2014 the TAC was set to 3,100t while 732t only were landed. Thus, IFREMER concluded that this level of TAC is inappropriate and advised for 2015 that "*a significant reduction in the TAC is required*".

The 2015 TAC was set to 2,170 t by French authorities. No scientific justification is provided for the choice of this value, except that it implies a 30 % reduction compared to the 2014 TAC. STECF stresses the fact that this TAC is still more than three time higher than the mean catch of the 2012-2014 period (703 t). Therefore, it is unlikely that a TAC of 2,170 t will be restrictive and result in the necessary reductions in fishing mortality required to achieve F_{MSY}.

STECF notes that no analytical forecast has been provided for this stock. In addition, estimates from the VPA undertaken in 2014 were not included in the report as they are considered to be highly uncertain. Consequently the *analytical assessments are incomplete*, and thus, according to Article 6 of Regulation 2015/104, *TACs to be determined by a Member State shall result in the exploitation of the stock consistent with the precautionary approach to fisheries management.*

STECF considers that in the absence of a catch forecast, it may be appropriate to base a TAC on the ICES DLS approach. Using biomass estimated from the VPA as biomass index, the stock falls under category 3, and thus in order to achieve F_{MSY} in 2015, the TAC could have been derived as follows (based on ICES 2012):

1. $C_{2015} = C_{2014} \cdot (I_{2013\text{-}2014}/I_{2010\text{-}2012}) \cdot F_{MSY}/F_{sq}$, where the $F_{0.1}$ value, derived from the yield per recruit curve, could be considered as an F_{MSY} proxy.
2. Apply a 20% Uncertainty Cap to the catch advice.

No values are provided in IFREMER's reports allowing this calculation, but based on visual interpolation of available graphs, indicates that the ratio $I_{2013\text{-}2014}/I_{2010\text{-}2012}$ is lower than 0.8, while F_{MSY}/F_{sq} is lower than 0.3. This would lead to an estimate for the advised catch for 2015 lower than 140t (732*0.8*0.3*0.8), around 5 times less than the current catch and 15 times less than the TAC set by the French authorities.

Because of the uncertainty affecting this calculation, STECF acknowledges that it should be considered as illustrative of one methodological approach that could be applied.

STECF also acknowledges that managers may wish to consider social and economic implications in deciding on the measures required to reach F_{MSY} by 2020 at the latest.

STECF conclusions

STECF considers that more information should be provided by the French authorities regarding the current stock status of the shrimp (*F. brasiliensis*), and the rationale for a single combined TAC for the two species.

STECF considers that improving the reliability of the stock assessment and the development of a catch forecast should be considered as a priority.

STECF concludes that, whatever the environmental effect on shrimp recruitment may be, the brown shrimp stock of French Guyana appears to be severely overfished and overfishing is currently occurring. Consequently effective management measures to control catch should be implemented with some urgency.

In accordance with Article 6 of Regulation 2015/104, STECF considers this should be achieved by setting a restrictive TAC. According to estimates available from the most recent stock assessment, the application of the ICES DLS approach would give rise to maximum catches of ~140t, which is five times lower than recent catches. Thus, STECF consider that the TAC in 2016 should be limited to 140t.

References

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6.4. Article 11 cod plan exclusions – Isle of Man

Background

Council Regulation 1342/2008 establishes a long-term plan for cod stocks and the fisheries exploiting these stocks. Under Article 11(2) the Council may, acting on a proposal from the Commission and on the basis of information provided by the Member States and on the Advice of STECF, exclude certain groups of vessels from the application of the effort regime.

The current exclusions for groups of vessels from Sweden, the United Kingdom, Ireland and Poland are described in Council Regulation (EC) No 754/2009, as amended. Member States must submit annually, appropriate information to the Commission and STECF to establish that the conditions for any exclusion granted remain fulfilled. Reports on Art 11 are due 31st March. Information has been submitted in relation to the operation of a queen scallop fishery by the Isle of Man in the Irish Sea.

Request to the STECF

Based on the information provided by the Member State in support of the continuing exclusions granted under Article 11, the STECF is requested to assess whether the group of vessels concerned have complied with the conditions set out in the decision on exclusion. In carrying out its assessment, the STECF is requested to:

a) advise whether the data on catches and landings submitted by the Member State

support the conclusion that during the preceding fishing season (from the date of the exclusion), the vessel group has (on average) caught less than or equal to 1,5% of cod from the total catches of the vessels concerned;

b) specify the reasons, if the information presented gives indications on the non-fulfilment of the conditions for exclusion.

In carrying out its assessment, the STECF should consider the rules on vessel group reporting established in Article 4 of Commission Regulation (EU) No 237/2010 laying down detailed rules for the application of Council Regulation (EC) No 1342/2008.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

STECF observations

Article 4 of Regulation 237/2010 requires Member States to report on activities carried out by the group or groups of vessels which have been excluded from the effort regime in accordance with Article 11(2)(b) of Regulation 1342/2008. Report should include details of the vessels involved and their activities or technical characteristics leading to cod catches of less than 1.5% of their total catch and the monitoring procedures used to ensure that these vessels comply with the condition for exclusion.

Observer schemes should collect a range of fisheries data concentrating on vessels that have been excluded from the effort regime. The report shall be sent in accordance with the requirements set out in Tables 1 and 3 of Annex I of the implementing regulation.

Data complying with Table 1 and Table 3 format have been received from the Isle of Man.

Isle of Man Queen Scallop TR2 vessels

The Isle of Man submitted only the explanatory tables accordingly to the Article 4(3) (Table 1 and Table 3). These tables have been provided in individual worksheets in an accompanying Excel file. A report was not submitted.

STECF conclusions

Information provided in the Excel worksheets have not been properly detailed in a report, however STECF was able to calculate cod catch rates. The data concern 22 vessels targeting Queen Scallop (*Aequipecten opercularis*), fishing with the grid and 70 mm in area 27.7a. STECF notes that the catch weights in the excel file are expressed in kg, these values of total catch are very low (table 3) and STECF assumes that these weights are expressed in tonnes.

According to Table 3, 26 trips were observed. The Table indicates that 0.31 % of sampling intensity was observed. Very few cod was caught during the observed trips and amounted to 0.15% of the total catch. Provided that the results presented by the Isle of Man Authorities are representative of the entire group of vessels, it appears that, in 2014 cod catches were less than 1.5%.

6.5. TAC adjustments for stocks under the landing obligation

Background

Member States regional groups have identified fleet segments which in 2016 will be subject to the landing obligation as well as specific conditions under which a limited amount of discards may continue.6 These fleet segments have been defined on the basis of catches of targeted species by certain fleets operating in different areas. The CFP allows for TAC adjustments to be made for those stocks under the landing obligation, recognising that fish that otherwise would have been discarded is now to be landed. These adjustments are to be made on the basis of the contribution by the fleets under the landing obligation to total catches and discards of the concerned stocks.

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

DG MARE issued an ad hoc contract with the below listed ToRs in preparation for the plenary meeting.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Request to the STECF

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

1. To provide information on (i) the contribution7 (%) of each fleet segment identified under the Member States' joint recommendations to total catches and discards of the stocks/TACs in Table 1 and (ii) the discard rate[8] of each fleet segment in relation to the same stocks/TACs in Table 6.5-1.

Table 6.5-1

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

6 Member States' Joint Recommendations.
7 Over the last 2 years on average (2013, 2014).
8 Discards relative to catches of the concerned stock on a fleet basis only.

Nephrops Area VII		
Nephrops Area VI		
Haddock Area VIIa		
Haddock Ices Area Via and Union waters of Area Vb		
Whiting ICES Area VIId		

2. In the absence of discard information per fleet segment or partial fleet segment to comment, for each of the concerned stocks, on the likelihood that fishing mortality will increase if the average discard rate[9] given by ICES for the entire stock is used as an approximation to calculate discards for the fleets under the landing obligation (as defined in the Joint Recommendations provided by the Member States regional groups).
   For each stock where STECF identifies a high risk level associated with using the average discard rate, STECF is requested to comment on whether an alternative discard rate could be applied for the purpose of calculating TAC adjustments.

The Commission informed the STECF that this ToR 6.5 on potential TAC adjustments for stocks under the landing obligation would need to be treated with highest priority. The Commission requested the STECF to provide its advice on this subject by the end week of the plenary meeting if possible. This advice would thus been published as a stand-alone opinion/report of the STECF prior to the plenary report. See also section 3.1 of the present report.

Advice on the TAC adjustments for stocks under the landing obligation has been released by the STECF on 13 November 2015 (STECF-15-17, https://stecf.jrc.ec.europa.eu/reports/discards)

6.6. Review of Herring VIa advice

Background

As a result of the revised 2015 Benchmark for herring in VIa and VIIb,c, ICES now gives one advice (zero TAC) for the combined area VIa(N) VIa(S), and VIIb,c. ICES still considers two separate stocks exist, but it is not currently possible to segregate them in commercial catches or surveys.

ICES advises that a rebuilding plan be developed for this stock.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

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

Request to the STECF

STECF is requested to review the ICES advice, including the reports from the revised benchmark and HAWG, to

1. Identify elements which should be included in a rebuilding plan, e.g. to allow capture at spawning time only for each stock to ensure only the relevant stock component is taken in the appropriate area.

2. Comment on the catch option identified by ICES which is based on an F of 0.05.

STECF response

1. Elements for a rebuilding plan

STECF observes that herring that spawn in VIaN are considered to be a separate stock from those that spawn in VIaS and VIIbc, and until 2015 separate stock-specific assessments and advice were provided by ICES. However, outside of their respective spawning seasons, both stocks are known to mix and mixed catches are taken in the summer acoustic survey in VIa.

In the 2015 benchmark, ICES intended to use separate stock-specific tuning indices, rather than the area-specific tuning indices which were used previously, to undertake separate stock-specific assessments, but this proved impossible. Hence the advice for 2016 is based on a combined stock assessment.

While agreeing that at present the combined stock assessment is the best assessment available, STECF notes that it does not provide any information about the recent historical development and current status of the individual stocks. Without such information it is not possible to predict the impact that a rebuilding plan for the combined stocks will have on each of the component stocks. Hence STECF is unable to advise on the specific provisions of such a plan. Nevertheless, STECF proposes the following points for consideration in the interim, i.e. until reliable stock-specific assessments become available:

- To be precautionary catches from the herring stocks in divisions VIaN and VIaS, VIIb, VIIc should be kept at a low level.
- From a stock assessment perspective, it would be beneficial to allow small catches to maintain an uninterrupted time series of fishery-dependent catch data from the stocks in both management areas to enable the collection of baseline data that can be used to develop survey-based stock-specific tuning series, so that in future, stock-specific assessments can be undertaken. For this purpose,

    - If any fishery-dependent catches are taken, they should be taken from both stocks, although STECF cannot advise on the respective proportions between the two stocks. In order to ensure that stock identity of fishery-dependent catches is correctly assigned, mixed aggregations of herring should be avoided. This could be done by allowing targeted catches to be taken only during the respective spawning periods from the respective spawning areas of the two stocks (VIaN, VIaS/VIIbc). Such a measure could be accompanied by a provision that any incidental catches taken

outside the spawning seasons or outside of the spawning areas cannot be sold for human consumption but must be landed and counted against the quotas.

- To maximize the utility of catch data, catches from the spawning grounds of each stock should be as representative as possible for their entire respective spawning periods and areas and should thus be taken at multiple times throughout their respective spawning periods and at multiple places throughout their respective spawning grounds.

STECF notes that recent genetic sequencing work conducted by University College Dublin has shown the potential for stock segregation (Farrell *et al*. unpublished data). STECF considers that when, in the near future, survey catches can be genetically (or by any other scientific method) assigned to each stock, separate stock assessments should again be carried out. At that time, rebuilding/management plans should be formulated according to the status of each stock.

2. Catch option

While agreeing with the ICES advice for zero catch in 2016, STECF acknowledges that managers may wish to set some level of fishing opportunity in order to mitigate the full socio-economic impact of a zero TAC. Furthermore, because herring are already subject to the landing obligation and there is no *de minimis* provision for pelagic fisheries to discard catches of herring in northwestern waters, failure to provide some level of TAC for herring in divisions VIa and VIIbc to account for incidental catches of herring in pelagic fisheries targeting other species, would imply cessation of all pelagic fisheries activity in these areas. Furthermore, a limited catch will also permit the collection of fishery-dependent data on catches from spawning aggregations, which will permit the collection of baseline genetic (or other stock ID) data. Such data are required to allocate individuals caught in the summer survey in VIa to the separate stocks. This would then allow separate stock-specific tuning indices to be developed which will permit separate single-stock assessments to be undertaken in the future.

While STECF is unable to anticipate a level of TAC that managers might wish to establish for the combined stocks or how such a TAC should be allocated to the two management areas ([1.] Union and international waters of Vb, VIb and; [2.] VIaN and VIaS, VIIb, VIIc), STECF notes that the catch (8,509t) corresponding to F = 0.05 is predicted to result in a 17% decrease of SSB in the autumn of 2016 (relative to autumn 2015), which is slightly greater than the predicted 14% decrease under the zero catch option. STECF suggests that, if managers decide to establish a non-zero TAC, the points raised in section 1 above should be taken into consideration.

6.7. Management measures for sole in area VIId

Background

The stock of sole in VIId is exploited by France, Belgium and the United Kingdom and some of the fleets segments depend very highly on this stock. ICES advice indicates that, similarly to 2015, TAC reductions should be considered for 2016.

During the Fisheries Council in December 2014, the French and the Belgian authorities issued a statement in which they committed to taking management measures to preserve the fisheries and the sole stock in VIId.

During the April 2015 Plenary, the STECF assessed the Belgian management measures[10]. During the July 2015 plenary, the STECF assessed the French management measures and the management strategy proposed by the NWWAC based on a constant 3,000t TAC until 2020[11]. The STECF concluded that supporting analyses presented by IFREMER and CEFAS used a deterministic forecast based on a constant recruitment and therefore did not take account of the risk of not reaching F_{MSY} within the timeline prescribed by the CFP. Using the same ICES stock assessment data, STECF ran a Management Strategy Evaluation (MSE) and concluded that '*there is a significant risk that [a constant TAC of 3,000t] will not deliver F_{MSY} by 2020 if recruitment remains at or below the long term average. In comparison, a lower constant TAC around 2,750 t is estimated to reduce the risk of not achieving F_{MSY} by 2020 to below 5%.*'

In September 2015, CEFAS published a further paper[12] and the Commission notes that it erroneously refers to the STECF using an inadequate F_{MSY} value.
In October 2015, the NWWAC presented an updated version of their management strategy.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Requests to the STECF

1. The STECF is requested to review the CEFAS paper dated 10 September 2015 and comment in particular on:
   1.1. the assumptions underlying the forecast
   1.2. the appropriateness of the forecast method used as regards the assessment of the risk of not reaching F_{MSY} by 2016 where possible and by 2020 at the latest
   1.3. the following statement at the bottom of the 'Results' section, especially the text underlined: '*Tighter constraints in the distribution of fishing mortality will be achieved when TACs are set annually based on a stock assessment due to more information on the recruitment abundance being available from surveys, and <u>therefore the stochastic scenarios presented by STECF and in this paper cannot be used to infer the probability of keeping fishing mortality at the target only the likely outcome of achieving it in the short term</u>.*'

STECF response

STECF was asked by the Commission Focal Point for ToR 6.7 not to comment directly on the elements 1.1, 1.2 and 1.3 above. However, some explanatory comments for each are given below and in addition, background information regarding the formulation and assumptions underlying the MSE for VIId sole and for MSEs in general is provided at the end of this section of the report (p. 40).

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10 http://stecf.jrc.ec.europa.eu/documents/43805/991908/2015-04_STECF+PLEN+15-01_JRC95802.pdf
11 http://stecf.jrc.ec.europa.eu/documents/43805/1099561/2015-07_STECF+PLEN+15-02_JRC97003.pdf
12 http://www.nwwac.org/_fileupload/Papers%20and%20Presentations/2015/Dublin/sole/Sole%20in%20VIId%20evaluation%202%20CEFAS.pdf

1.1. Assumptions underlying the forecast

No direct response to this request is provided. See the explanatory text at the end of this section of the report for background information on assumptions underlying MSEs.

1.2. Appropriateness of the forecast method used as regards the assessment of the risk of not reaching F_{MSY} by 2016 where possible and by 2020 at the latest

STECF underlines that there is no single procedure for conducting Management Strategy Evaluations (MSEs) and that it is not appropriate to contrast one method over another. STECF notes that the slight differences observed between the STECF and CEFAS methods (e.g. achieving the target with a probability of 70% [STECF] or 64% [CEFAS] with a TAC of 3000t) may arise through differences in how the simulations were setup. STECF provides general background detail on the methodology and assumptions underlying MSEs at the end of this section of the report (see Explanatory information on MSE approaches, p. 40).

1.3. The statement *'Tighter constraints in the distribution of fishing mortality will be achieved when TACs are set annually based on a stock assessment due to more information on the recruitment abundance being available from surveys, and <u>therefore the stochastic scenarios presented by STECF and in this paper cannot be used to infer the probability of keeping fishing mortality at the target only the likely outcome of achieving it in the short term</u>.'*

STECF does not understand the statement as written and suggests that clarification is sought from the authors.

2. STECF is requested to assess whether the updated management strategy proposed by the NWWAC is precautionary (*i.e.* precautionary in the context of the MSY framework is when the probability that B falls below B_{lim} is below 5% (p ($B < B_{lim}$) ≤ 0.05) and the probability that F_{MSY} is reached is superior or equal to 50% (F as a target, p ($F \leq F_{MSY}$) $\geq$ 0.5). This assessment should take account of clauses 1-4 in the NWWACs' proposed strategy (see 'Documents', clauses renumbered below) and also consider a biomass safeguard whereby if in the ICES assessment, the biomass in the start of the year for which advice is given is assumed to be below B_{pa} ($B < B_{pa}$), then the TAC is set at a level corresponding to a fishing mortality equal to $F_{MSY.}$

   For the sake of clarity, this question will refer to the clauses of the NWWAC's management strategy as numbered below:

   1. Reduce the TAC in 2016 to 3,000t (14% reduction) and keep it constant to reach F_{MSY} (0.3) by 2020 at the latest.

2. If (in any year between 2016 and 2019) a TAC of 3,000t is predicted to result in a fishing mortality rate below F_{MSY}, then the TAC is set to a level corresponding to a fishing mortality equal to F_{MSY}.
3. If ICES advises in 2019 that the constant TAC of 3,000t will not result in a fishing mortality rate below or at F_{MSY} in 2020 and $B > B_{pa}$, then the TAC is set to a level corresponding to a fishing mortality equal to F_{MSY} in 2020.
4. If ICES advises in 2019 that a TAC of 3,000t will not result in a fishing mortality rate below or at F_{MSY} in 2020 and $B < B_{pa}$, then the TAC set to the level advised by ICES.

Comments from the Commission:
- clauses 3 and 4 are mutually exclusive
- clause 2 is contradictory with the objective of stable catches. Given the current state of the stock, the Commission considers that in principle, not retaining it would allow quicker recovery and increased resilience.
- the STECF evaluated clause 1 in July 2015 so it is not necessary to reassess it if the review of the CEFAS paper does not modify STECF's previous assessment but results should be copied in the results table.

In its response the STECF is requested to provide (a) table(s) giving for each year from 2016 to 2020 giving the probability of reaching F_{MSY} for each of the combinations below[13].

- Clause 1 (already assessed in July 2015, for reference)
- Clauses 1 + 3
- Clauses 1 + 4
- Clauses 1 + 3 + biomass safeguard
- Clauses 1 + 4 + biomass safeguard
- Clauses 1 + 2 + 3 + biomass safeguard
- Clauses 1 + 2 + 4 + biomass safeguard

STECF response
Throughout the STECF response, the reference point $MSYB_{trigger}$ is used instead of B_{pa}. Both reference points have the same value (8,000t), but $MSYB_{trigger}$ is the wording now used by ICES in accordance with the MSY approach.

To respond to this request, new sets of MSE simulations in addition to those undertaken during STECF PLEN 15-03 were carried out. Such simulations were not straightforward and the number of clauses and safeguards made the coding and quantification of the management strategies particularly complicated, since a lot of clauses had to be systematically tested. As a general principle, STECF considers that carrying out complex quantitative analysis, like

13 The STECF may refer to ICES special advices on the assessment of the SWWAC's management strategy for the sole stock in the Bay of Biscay:

http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/Special%20requests/EU_sole_in_the_Bay_of_Biscay.pdf
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/Special%20Requests/EU_sol_bisc_special%20request_clarification.pdf

MSEs, during the plenary meeting should not be pursued, except in exceptional cases. Quality control and scrutiny of the results during plenary may be compromised as model set up and outputs generally require more detailed scrutiny than is practically possible during a plenary meeting. MSE's concludes that such analysis should be conducted under the auspices of a dedicated expert group.

STECF notes that the clause conditionalities apply simultaneously and on several interrelated parameters for biomass, catch and fishing mortality, which can also be estimated at different points in time (assessment year, intermediate year, or TAC year). STECF notes that some clauses may potentially conflict with one another e.g. if a biomass safeguard requires decreasing fishing mortality while at the same time fishing mortality is meant to increase to F_{MSY} as in strategy "Clause 1+2+3+safeguard" below, or may give different outcomes when applied in a different order of priority by managers. So it is unclear how the clauses might be applied in practice. Applying such rules on a single outcome of a unique ICES stock assessment is indeed in itself not entirely straightforward, but parameterising the rules generically in a MSE over several stochastic iterations and years is complex and potentially error-prone. Additionally, the results may be difficult to interpret, as it becomes difficult to distinguish the individual effects of the different conditionalities.

STECF notes that such analysis are time consuming and considers it more appropriate that such work is undertaken during a dedicated EWG together with key stakeholders where issues such as sequencing of clauses, model limitations and assumptions. can be discussed more fully.

STECF has merged the clauses 3 and 4 into a single conditionality (hereafter referred to as clause 3), since they are the two options of the same condition: in 2020, those iterations where SSB is above $MSYB_{trigger}$ then $F = F_{MSY}$ and those iterations where SSB is below $MSYB_{trigger}$ then F is set lower than F_{MSY} according to the ICES rule.

Also, on the basis of the points discussed in relation to request 1 above, STECF has checked the other sources of errors and variability that could impact the evaluation, and concluded the following:

1) *Variability in weight at age*: the weights for that stock are not particularly variable for the most exploited ages (*cf.* ICES WGNSSK report 2015[14], Figure 9.8): The CV over the entire time series is less than 15% for any age above age 2, so including this variability would have a limited effect on the realised F. The simulations use the average 2012-2014.
2) *Variability in selectivity*: the selection pattern (F at age / F_{bar} 3-7) has been more variable than weight at age. This is particularly true for the age ranges subject to lower exploitation (<3yr). In addition, there has been a gradient over time, and the exploitation of young ages has clearly been lower in the recent period, see Figure 6.7-1 for the years 2000-2014. (NB: this estimate is based on an assessment performed

14 http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WGNSSK/11%20WGNSSK%20report%20-%20Sec%2009%20Sole%20in%20VIId.pdf

with landings only, and the selection pattern on discards is unknown). The simulations use the average 2012-2014.

3) *Assessment error*: The assessment is reasonably consistent internally, without any major retrospective pattern (ICES WGNSSK report 2015, Figure 9.20), therefore, the effect of assessment bias on the forecast can be considered to be marginal.
4) *Uncertainty in the starting conditions*: STECF notes that the projections performed by PLEN 15-02 did not include uncertainty in the starting conditions (stock numbers in 2015). It would be preferable to include this variability in the simulations given the focus on short-term outcomes, but as noted above, the uncertainty in the assessment is limited for this stock (except for the prediction of recruitment) and therefore the omission of this variability is unlikely to have a significant impact on the results of the simulations.

In view of point 4 above, STECF did not update the setup of the MSE compared to that presented in PLEN 15-02. STECF underlines that the outcomes of the simulations provide a basis for comparing between strategies but that the probability distributions are indicative rather than absolute values. There are two changes compared to the July MSE:

- the results are now based on 1000 iterations rather than 100, according to the recommendations of ICES WKGMSE (2013);
- the F_{MSY} threshold is now set at 0.30; i.e. in July all iterations with F values under 0.31 where still counted as being at or below F_{MSY} (loose definition), whereas now all values are first rounded at 2 digits and those above 0.30 are counted as above F_{MSY} (strict definition). As shown further below (Figure 6.7-2), this choice is actually rather important in the present work, since in many iterations, F fluctuates between 0.30 and 0.31, and this can affect significantly the perception of the success of the strategy depending on how loose the definition of "above F_{MSY}" can be

Consequently, STECF also presents updated results for the run with constant TAC throughout (Clause 1) as well as the ICES F_{MSY} advice rule (AR, i.e. where the target F is reduced below F_{MSY} when the SSB is assessed to be below $MSYB_{trigger}$) with the 1,000 iterations and the results of the other clauses.

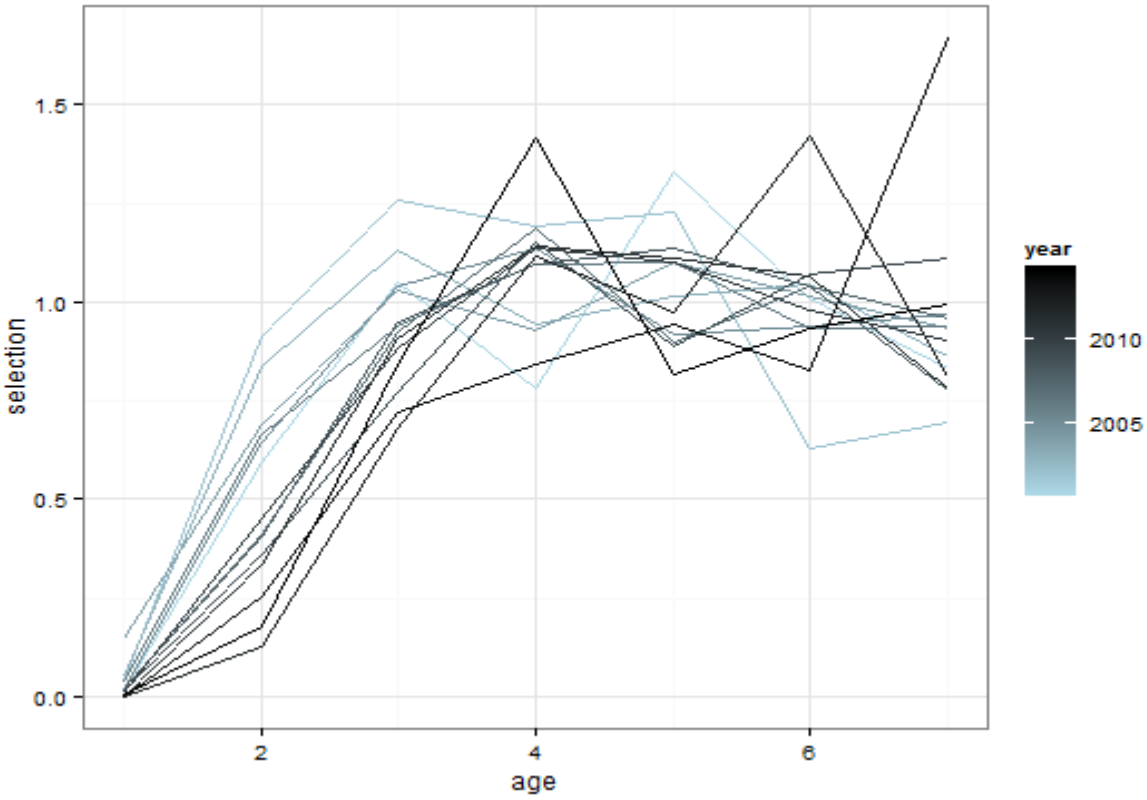


Figure 6.7-1 Selection pattern (F at age/ F_{bar} 3-7) for sole VIId between 2000 and 2014. The colour gradient relates to the year, with the darkest lines being the most recent. Estimates based on landings only.

Results of the MSE

Seven strategies have been performed:

A: F_{MSY} ICES Advice Rule (ICES MSY approach)
B: Clause 1 (constant TAC at 3,000t)
C: Clause 1 + safeguard, where F = F_{MSY} if B < $MSYB_{trigger}$
D: Clauses 1+3 (constant TAC until 2019, ICES Advice Rule in 2020)
E: Clauses 1+3 + safeguard
F: Clauses 1+2+3+safeguard (if the TAC at 3,000 t gives F < F_{MSY}, then F = F_{MSY}; ICES rule in 2020)
G: Clauses 1+2+3: same as F but without the safeguard

The main outcomes of the results in term of risk (risk of realised F being above F_{MSY} in the given year, risk of SSB being below $MSYB_{trigger}$ at the start of the following year) are presented in Table 6.7-1 below. The supplementary information in term of average performance of each strategy (median fishing mortality, median landings and median SSB) is given in Table 6.7-2.

	2016		2017		2018		2019		2020	
	F> F_{MSY}	B<B_{trig}	F> F_{MSY}	B< B_{trig}	F> F_{MSY}	B< B_{trig}	F> F_{MSY}	B< B_{trig}	F> F_{MSY}	B< B_{trig}
A	32.5	0.8	39.5	1	33.9	0.2	20.8	0.1	22	0.1
B	100	10.8	84.3	9.6	62.1	8	44.7	6.3	28.9	5.2
C	100	10.8	76.9	6.3	51.4	2.9	40.9	1.8	23.6	1
D	100	10.8	84.3	9.6	62.1	8	44.7	6.3	20.7	1.6
E	100	10.8	76.9	6.3	51.4	2.9	40.9	1.8	21.7	0.5
F	100	10.8	80.4	6.3	64.3	2.9	52.8	1.8	23	0.5
G	100	10.8	87.8	9.6	74.9	8	56.3	6.3	21.9	1.6

Table 6.7-1 Risk (in %) by year of each management strategy for sole VIId (risk of realised F being above F_{MSY} in the given year, and risk of SSB being below B_{pa} at the start of the following year).

Median Landings	**2016**	**2017**	**2018**	**2019**	**2020**
A: F_{MSY} ICES_AR	2369	2841	3031	3255	3515
B: Clause 1	3000	3000	3000	3000	3000
C: Clause 1+safeguard	3000	3000	3000	3000	3000
D: Clauses 1+3	3000	3000	3000	3000	3324
E: Clauses 1+3+safeguard	3000	3000	3000	3000	3385
F: Clauses 1+2+3+safeguard	3000	3000	3000	3041	3335
G: Clauses 1+2+3	3000	3000	3000	3027	3278
Median F	**2016**	**2017**	**2018**	**2019**	**2020**
A: F_{MSY} ICES_AR	0.301	0.303	0.302	0.301	0.301
B: Clause 1	0.398	0.347	0.325	0.296	0.265
C: Clause 1+safeguard	0.398	0.334	0.306	0.292	0.261
D: Clauses 1+3	0.398	0.347	0.325	0.296	0.301
E: Clauses 1+3+safeguard	0.398	0.334	0.306	0.292	0.301
F: Clauses 1+2+3+safeguard	0.398	0.334	0.31	0.306	0.301
G: Clauses 1+2+3	0.398	0.347	0.325	0.307	0.301
Median_SSB	**2017**	**2018**	**2019**	**2020**	**2021**
A: F_{MSY} ICES_AR	9816	11003	12090	12838	13389
B: Clause 1	9145	10146	11223	12242	13328
C: Clause 1+safeguard	9145	10207	11289	12418	13594
D: Clauses 1+3	9145	10146	11223	12242	12944
E: Clauses 1+3+safeguard	9145	10207	11289	12418	13143
F: Clauses 1+2+3+safeguard	9145	10207	11268	12242	12862
G: Clauses 1+2+3	9145	10146	11191	12011	12715

Table 6.7-2 Average performance of each of the strategies in terms of median landings (upper table); median fishing mortality (middle table) and median SSB (lower table).

All scenarios demonstrate positive developments of the stock, with F and catch levels lower than observed in the history of the stock and increasing biomass (Figure 6.7-3).

All scenarios show that the median F is at or below F_{MSY} by 2020 for all strategies. Using the stricter definition of "above F_{MSY}" means that all strategies still have a probability of 20-30% of realised F being considered above F_{MSY}; nevertheless, this masks that in reality most of risk of F > F_{MSY} comes from the small variability of realised F around the target F in stochastic simulations: in practice, the realised F in 2020 is strictly below 0.31 for all strategies, except for the two strategies of constant TAC ("Clause 1" and "Clause1 + safeguard") where the risk of being strictly above 0.31 in 2020 is around to 20% (Figure 6.7-2)

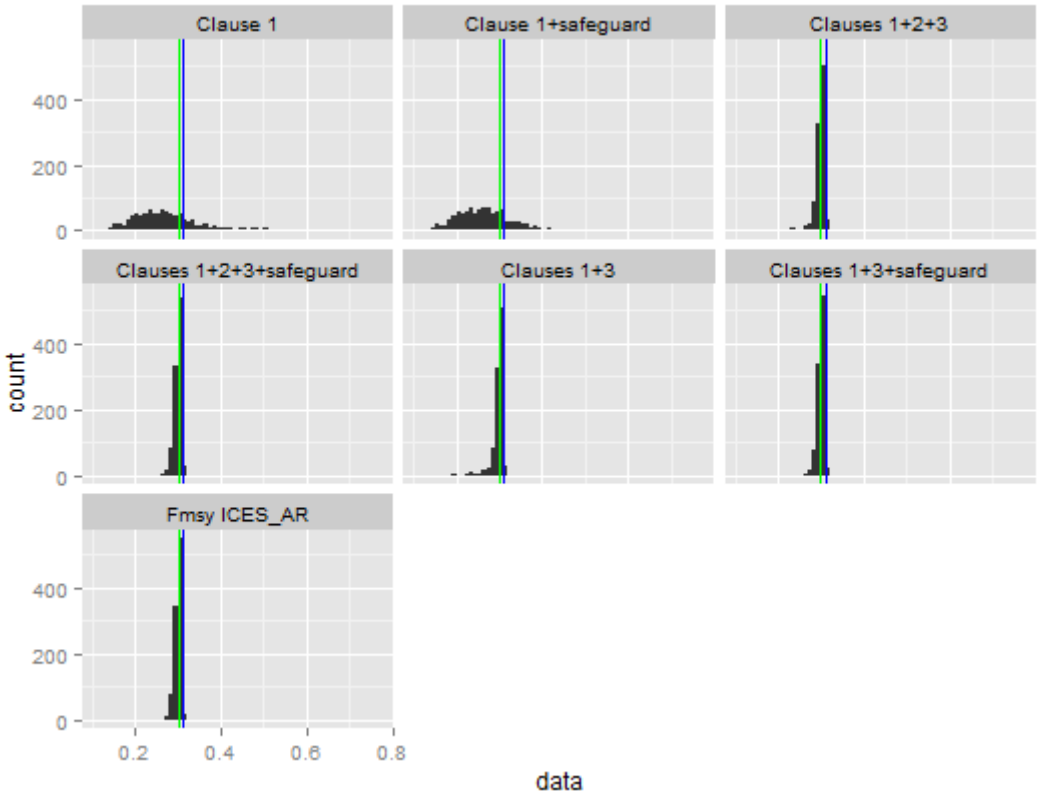
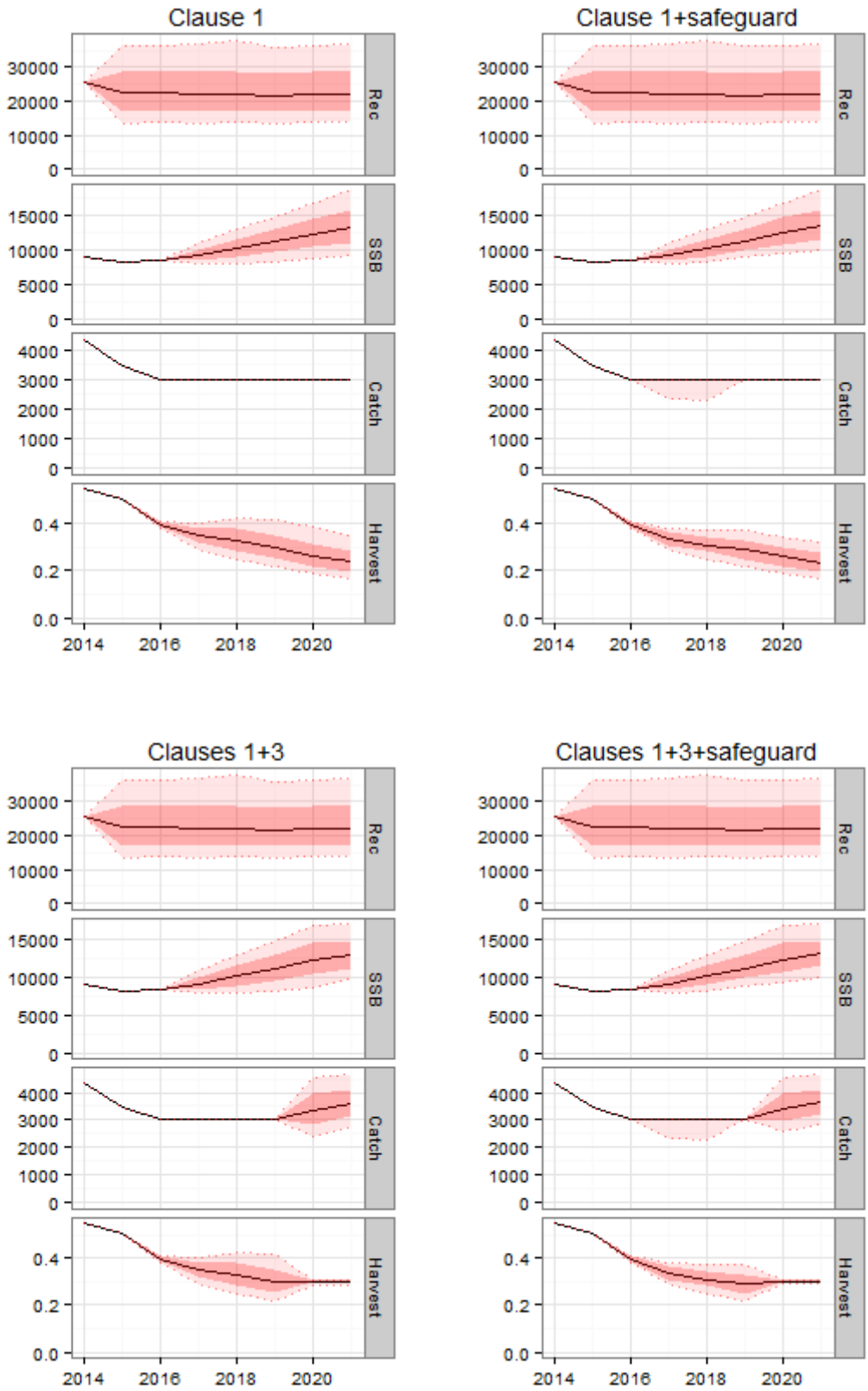
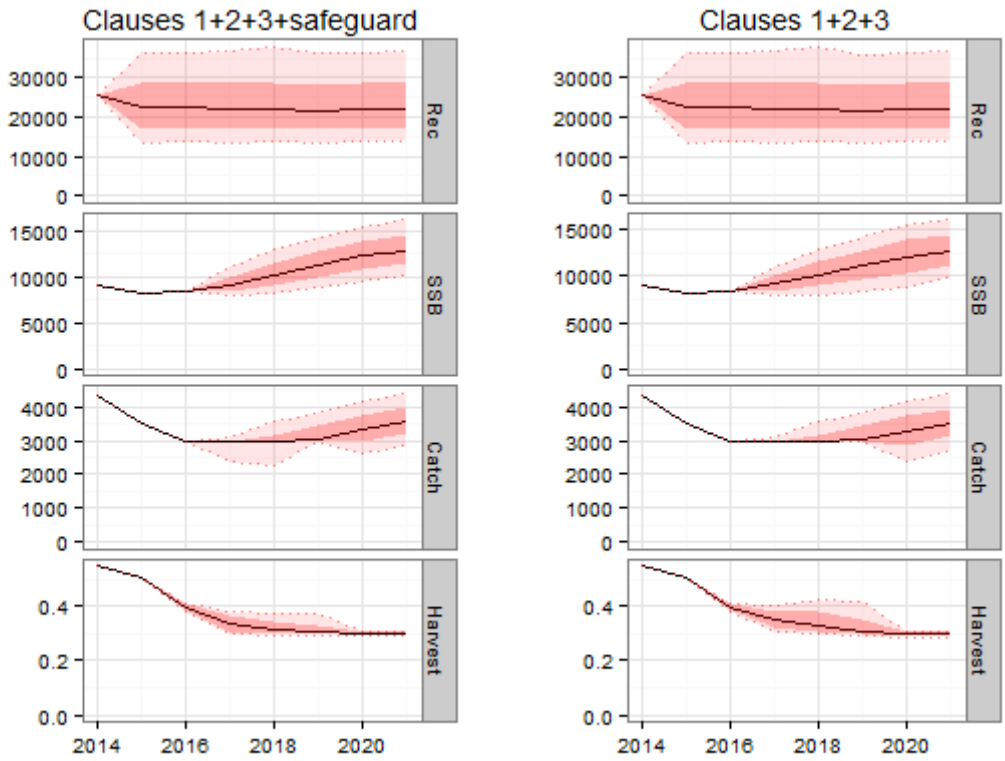


Figure 6.7-2 Distribution of the realised F in 2020 across 1000 iterations for the different strategies. Green line=0.30 (F_{MSY}). Blue line=0.31.

In terms of biomass, it is noticeable that the biomass safeguard contributes to reducing the risk of falling below B_{pa} after 2017 (Table 6.7-1). The scenario of constant TAC (Clause 1) maintains a risk above 5% to be below B_{pa} in 1st January 2021.

Noticeably, strategies involving a biomass safeguard imply a non-negligible risk (between 10 and 25% risk, pale pink area on figure 6 below) of TAC reducing below 3,000t in 2017 and 2018 if F has to be reduced to F_{MSY} to recover the biomass. This may happen if recruitment is below average over two or more consecutive years.


Clause 1
Clause 1+safeguard
Clauses 1+3
Clauses 1+3+safeguard
Rec
SSB
Catch
Harvest
30000
20000
10000
0
15000
10000
5000
0
4000
3000
2000
1000
0
0.4
0.2
0.0
2014
2016
2018
2020



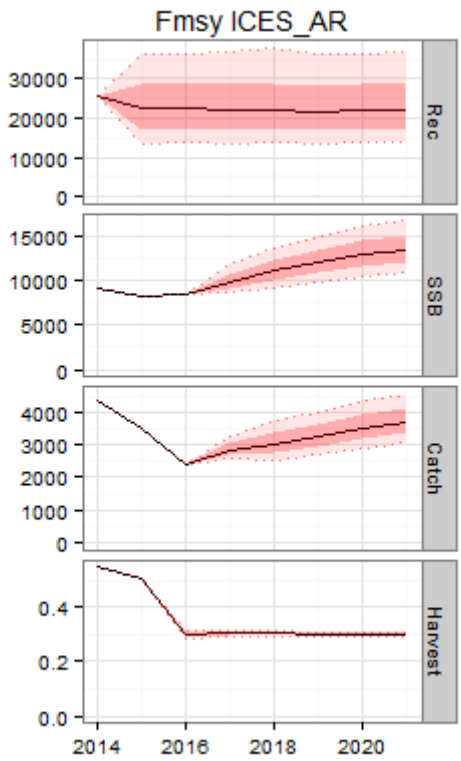


Figure 6.7-3 2014-2021 time series of projections for recruitment, SSB, catch, and F_{bar} for the seven strategies. Black line= median. Dark pink : 25-75% quantiles. Pale pink= 10-90% quantiles.

STECF conclusions

The probabilities and trajectories presented above are useful to compare the potential outcomes of different strategies across a variety of recruitment events over the next five years. Most scenarios present fairly comparable outcomes, with high probabilities of achieving F_{MSY} by 2020 and of maintaining biomass levels above MSY $B_{trigger}$.

The scenario of constant TAC 2016-2020 performed the poorest, with the highest probability of both over- and undershooting F_{MSY} and of falling below MSY $B_{trigger}$, indicating that a constant TAC is not a very robust strategy when stock productivity varies. The various clauses provide alternative mechanisms to address this variable productivity through trade-offs between catch and biomass, and the biomass safeguard is a useful buffer to ensure that fishing mortality will be reduced if recruitment is poor.

The achievement of MSY objectives by 2020 can thus be expected, provided that the TACs simulated here are strictly adhered to. STECF has not included the effects of sub-optimal implementation of the advised catch limits (i.e. catch > TAC), but it is obvious that any catch higher than advised by the rule will reduce the probability of achieving the management objectives. In particular, special care should be given to discard issues and to how the landings obligation will affect the fishery for sole in VIId.

STECF advises that a single management strategy (single combination of clauses) is chosen and adhered to over a multi-annual time frame. In addition, in cases where recruitment is poor, catch advice must be lowered. STECF notes that the chosen management strategy should be included in the catch option table in the annual ICES advice for the stock.

The scenarios presented here do not include the potential effects of the measures taken by France and Belgium to improve the exploitation pattern. These measures are expected to provide additional beneficial effects for the stock (see STECF plenary reports in April and July 2015), potentially leading to a quicker achievement of the management objectives for this stock.

References

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Kell, L. T., Mosqueira, I., Grosjean, P., Fromentin, J-M., Garcia, D.,Hillary, R., Jardim, E., *et al*. 2007. FLR: an open-source framework for the evaluation and development of management strategies. ICES Journal of Marine Science, 64: 640–646.

Explanatory information on MSE approaches

STECF notes that the recruitment of sole VIId does not show any particular pattern (Figure 6.7-4). High and low recruitments have been equally observed over time and over the range of spawning stock biomass. The highest recruitment estimate of the time series, observed in 2002, corresponded to the lowest SSB of the time series (7,600t in 2001). Additionally, there is no auto-correlation that would have suggested signs of prolonged high or low regimes. This implies that it is not possible to infer the expected strength of recruitment in one year based on recruitment in the previous years. STECF fitted the simplest stock-recruitment relationship, the "Hockey Stick" on the time series 1983-2012, comparably to ICES WKMSYREF3 (2014) (Figure 6.7-5). The model fits the breakpoint around the lowest observed biomass, and the average recruitment at 23953 thousands. Observed recruitments have been quite variable around this average, with a standard deviation of the residuals at 0.37. This fit and its use in the MSE using a lognormal distribution provides recruitment simulations largely similar to the CEFAS analyses.

On the basis of these historical analyses, STECF observes that there is no information to suggest whether the recruitment over the next few years is more likely to be at, below or above average. STECF notes therefore that the realised changes in biomass and fishing mortality are uncertain and heavily dependent on the actual recruitment which is highly variable without any clear link to the size of the spawning stock.

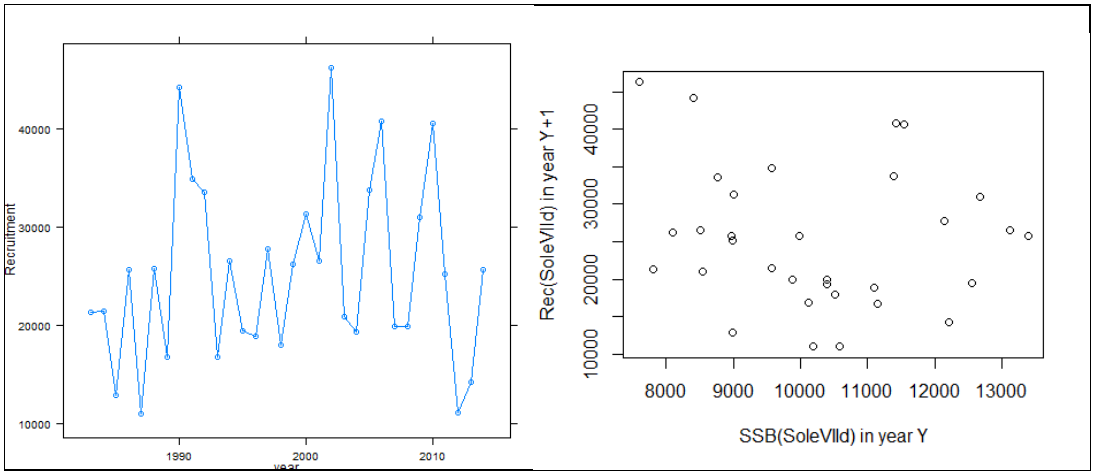

Figure 6.7-4 Dynamic of sole VIId recruitment. Left: recruitment over time. Right : recruitment over spawning stock biomass.

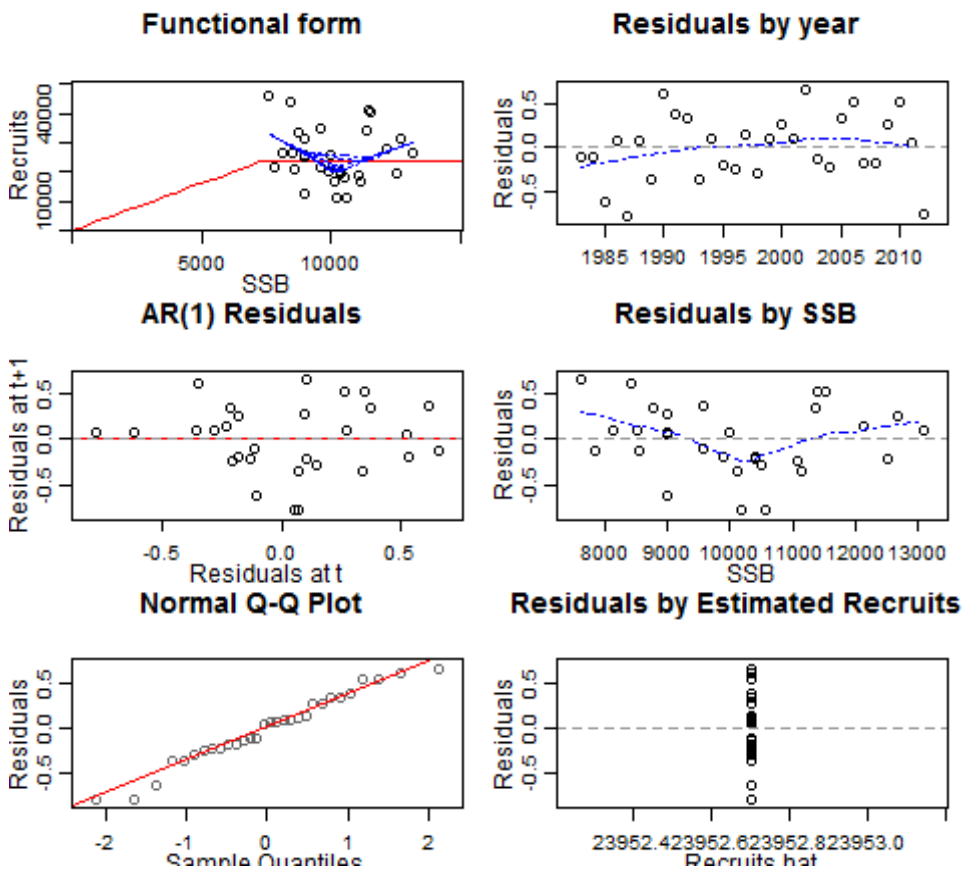

Figure 6.7-5 FLR Fit of the stock-recruitment relationship for the Sole VIId.

In practice, the specification of variability and uncertainty in a MSE can be performed in different ways. Furthermore, results differ whether the forecasts are set up as projections with or without feedback loops (Figure 6.7-6), where a feedback loop distinguishes between the target (intended) F used for setting the TAC, and the realised F which is the true fishing mortality on the stock that the TAC will actually imply (for example, if growth in the TAC year is lower than assumed in the short-term forecast, then the TAC in tonnage will imply a larger number of individual fish caught, and thus a realised F higher than intended). STECF projections are made using the code developed for running mixed-fisheries MSE projections in ICES WGMIXFISH (2014) and STECF NS-MAP (2015), but here applied to a single-stock single-fleet setup. This MSE is performed with a simple feed-back loop and including variability of the recruitment. In the annual short-term forecast projections, the intermediate year is constrained by the TAC rather than applying a status quo fishing mortality.

Ideally, a MSE could also include additional sources of variability, such as variability of growth and selectivity as well as various sources of errors (initial population numbers; observation error when catches are imperfectly monitored; assessment error when the assessment does not perfectly reflect the true stock; and implementation error, when the TAC is not perfectly implemented according to the management target). These sources of uncertainty were not implemented in the MSE during the plenary but these parameters are investigated and discussed under the response to ToR2 above.

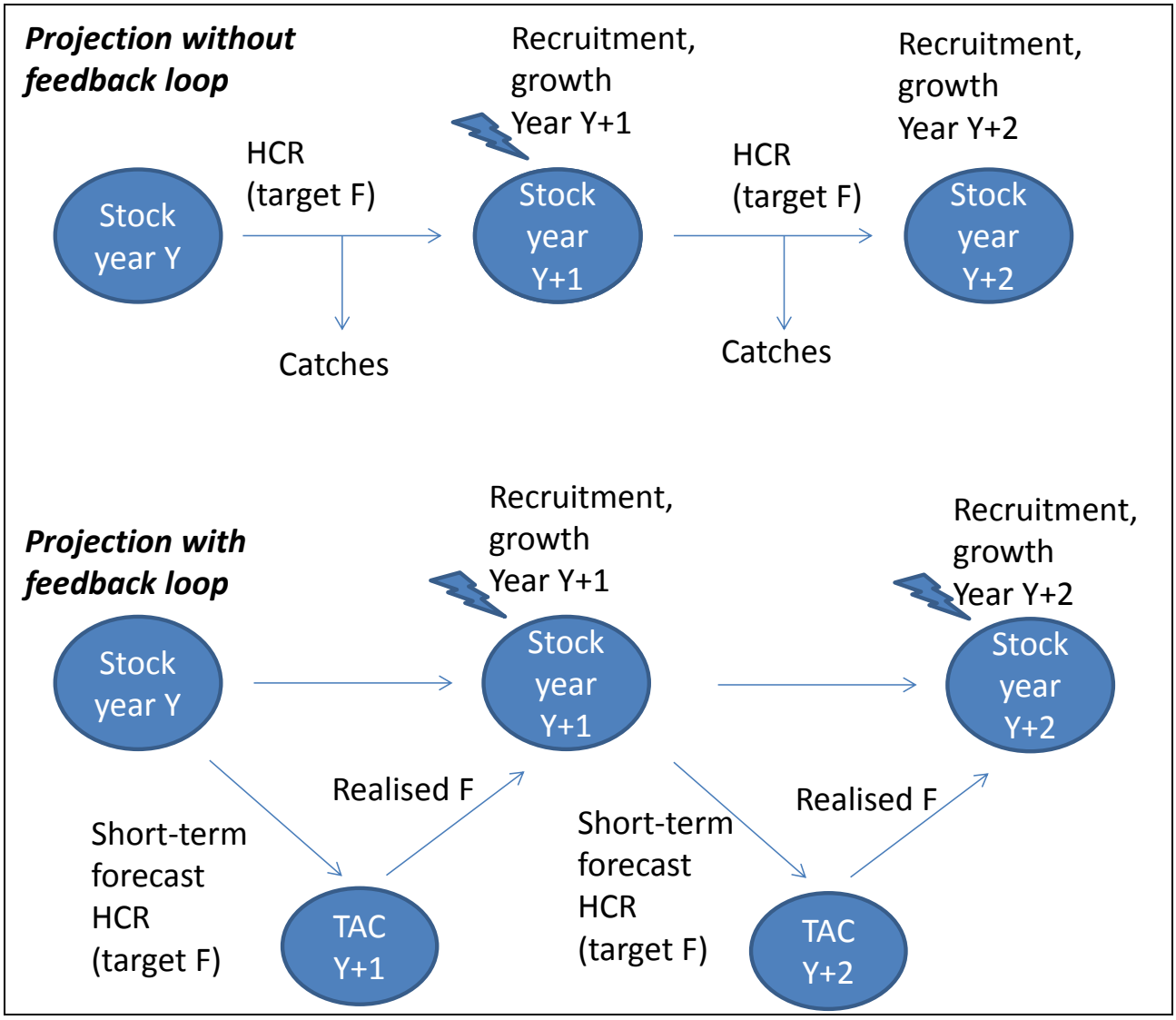

Figure 6.7-6 Schematic representation of a feedback loop in a Management Strategies Evaluation

While different methods will likely lead to comparable performance of different management strategies on average over the long term perspective, it is nevertheless true that they may produce different outcomes over short- and medium term projections (<5 years), where the first years of projection are most dependent of the parameterisation of the starting conditions.

STECF acknowledges that there can also be slight imprecision in how "above F_{MSY}" is defined. STECF (STECF PLEN 15-02) considered all iterations with F values less than 0.31 were at or below F_{MSY}, but a stricter definition has now been used below in responding to ToR 2 where the F_{MSY} threshold is set at 0.3, rather than considering F values < 0.31 being below F_{MSY}.. Additionally, it is likely that the slight differences observed between the STECF and CEFAS methods (e.g. achieving the target with a probability of 70% [STECF] or 64% [CEFAS] with a TAC of 3000t) may also arise in differences in the projections setup as

explained above. However, STECF considers that these differences are minor and do not affect the general perception of the analyses, which is that the chances of achieving the target with the constant TAC strategy can be considered as fairly high but not entirely certain. The probabilities are primarily useful for comparing one strategy compared to another one therefore STECF considers that the two models are largely in adequacy.

6.8. TAC options under management plan for North Sea sole and plaice

Background

ICES advice for the stocks of sole and plaice in the North Sea mentions catch options under the sole and plaice management plan (Council Regulation (EC) No 676/2007 of 11 June 2007), taking into account the relevant reference points for these stocks.

The Dutch authorities have sent to the Commission a report from the Dutch institute IMARES, which assesses alternative catch options.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Request to the STECF

The STECF is requested to assess the conclusions and scientific underpinning of the report.

STECF comments

The report is a quantitative analysis by IMARES in response to a request from the Dutch fishing industry. The request was to answer the question (translated from Dutch): "*What are the implications of an increase of respectively 10% or 15% of the 2016 North Sea sole catch advised by ICES for the development of the stock and the fisheries mortality in the following three years and the management objective of* F_{MSY} *in 2020?*"

The report presents a deterministic short term forecast (STF) and a stochastic medium term forecast (MTF). The STF follows the same procedure and assumptions as used at WGNSSK in 2015 as a basis for the current ICES advice. The MTF uses an expanded version of the model and methods used at the WKMSYREF3 in 2014 (ICES, 2014).

The conclusions are:

- If the advised TAC for 2016 is raised by 10%, then compared to a scenario with no increase in advised TAC:
    - SSB in 2017, and subsequent years, are predicted to be lower (~2% increasing to 5%).
    - F is predicted to be greater than F_{MSY} (0.22 > 0.20), but within the F_{MSY} range.
    - In the case of a one-off 10% increase in TAC for 2016 returning to F = F_{MSY} thereafter, a ~5% reduction in TAC could be expected in 2017, followed by on average ~200t less landings per year (2018-2020) compared to the case in which there is no increase in 2016.

- In the case of sustained fishing at F = 0.22, medium term landings are predicted to be ~5% higher than when fishing at F_{MSY} and SSB is predicted to be ~5% lower. A 12% reduction in F may be required in 2020 to reach agreed F_{MSY} targets.

- If the advised TAC for 2016 is raised by 15%, then compared to a scenario with no increase in advised TAC:
  - SSB in 2017, and subsequent years, is predicted to be lower (~4% increasing to 8%).
  - F is predicted to be greater than F_{MSY} (0.23 > 0.20), but within the F_{MSY} range.
  - In the case of a one-off 15% increase in TAC for 2016 returning to F = F_{MSY} thereafter, a ~12% reduction in TAC could be expected in 2017, followed by on average ~300t less landings per year (2018-2020) compared to the case in which there is no increase in 2016.
  - In the case of sustained fishing at F = 0.23, medium term landings are predicted to be ~7% higher than when fishing at F_{MSY} and SSB is predicted to be ~8% lower. A 17% reduction in F may be required in 2020 to reach agreed F_{MSY} targets.
- SSB remains above B_{pa} (and B_{lim}) with a high likelihood in the short and medium term for all scenarios.

STECF considers that the scientific underpinning of the analysis and the conclusions are sound.

Reference

ICES. 2014. Report of the Joint ICES–MYFISH Workshop to consider the basis for F_{MSY} ranges for all stocks (WKMSYREF3), 17–21 November 2014, Charlottenlund, Denmark. ICES CM 2014/ACOM:64. 147 pp.

6.9. Evaluation of three trawl designs in the Celtic Sea

Background

Commission Implementing Regulation (EC) 737/2012, as amended sets minimum gear requirements for particular vessels in the Celtic sea. However derogation from the specific requirement for a Square Mesh Panel (SMP) of 120mm to be fitted is possible for gears that have been assessed by STECF as having the same or greater selectivity for cod, haddock and whiting.

The UK have submitted the results of three trawl designs examining reduction of haddock catches, including the use of a 120mm square mesh panel.

Evidence from trials is presented on the performance of three trawl designs (120mm square mesh panel (SMP), low-lift trawl, horizontal separator trawl) aimed at reducing unwanted catches of haddock in the south west English otter trawl fishery.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Request to the STECF

The STECF is asked to assess conclusions and evaluate the evidence from these trails and to comment on the following

- One of the designs reported is the 120mm SMP as per the legal requirement identified above. STECF are asked to note the evidence provided in the use of this gear and to comment on the conclusions made.
- For the other two designs, STECF are asked to comment whether the low-lift trawl provides an effective option for selective improvement towards haddock, and comment on the potential to improve haddock selectivity using the separator panel.

The STECF finally is asked to comment on these two gears is respect to the requirements laid out in EC 737/2012.

STECF observations

Commission implementing Regulation (EU) No 737/2012 of 14 August 2012 on the protection of certain stocks in the Celtic Sea, states that: *"Fleets targeting Norway lobster and the fleets using bottom trawls and seines to target mixed finfish have high levels of haddock and whiting discards due to the poor selectivity of the gears used. ICES also states that the cod stock is highly dependent on recruitment of fish, and that technical measures should be encouraged to reduce discards. With recent high recruitment in both haddock and whiting stocks in the Celtic Sea, discarding is expected to get worse this year. Consequently, ICES advises that technical measures should be introduced urgently to increase selectivity and reduce discards of* ***haddock***, ***whiting*** *and* ***cod****".*

STECF notes that the main aim of the abovementioned UK trials was at reducing unwanted catches of *haddock* in the otter trawl fishery, however EC Reg. No 737/2012 stipulates the requirement to increase selectivity for cod and whiting also.

120mm square-mesh panel (SMP120)

The use of this gear modification has been mandatory in ICES sub divisions VIIf,g and northern VIIj since 2015. STECF considers that these trials provide a useful comparison between the current and previous regulation. The results show there was a marginal but statistically significant reduction in haddock of lengths between 37 and 45cm with the SMP120 compared with the SMP100 (Figure 6.9-1). STECF notes that very few cod (45 individuals) and whiting (12 individuals) were caught during the period of the trials. This prevents any statistically meaningful conclusions being drawn concerning these two species.

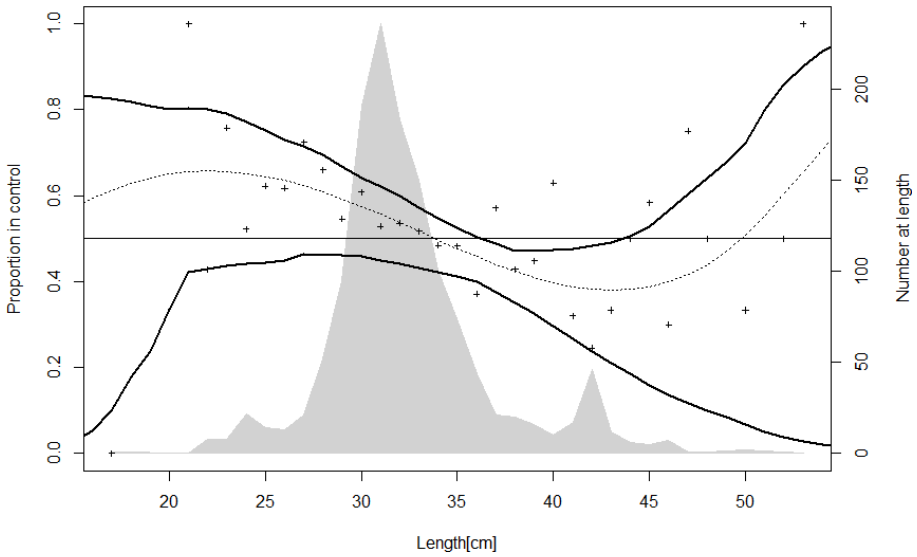

Figure 6.9-1 Catch comparison analysis for haddock in trials with SMP120.

Low lift trawl

The trials demonstrated a statistically significant reduction of 63 % in the number of haddock caught when using the modified low-lift trawl and that these reductions occurred across all length classes. (**Error! Reference source not found.**). Catch comparison analysis was carried ut also for cod. Figure 6.9-3shows no significant change in catch for this species. Catch reduction both in cod and whiting catches was of 38 and 84 %, respectively. Datasets of the different trials have been provided in individual worksheets in an accompanying Excel file. Using these data, STECF performed a *One-way* ANOVA and proved that the reduction for cod was not significant ($p = 0.711$, Table 6.9-1), while it was highly significant for whiting ($p < 0.01$, Table 6.9-2).

Table 6.9-1 Results for ANAOVA analysis for cod

ANOVA for COD	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Between Groups	1.720	1	1.720	.144	**0.711**
Within Groups	143.708	12	11.976		
Total	145.429	13			

Table 6.9-2 Results for ANAOVA analysis for cod

ANOVA for WHG	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Between Groups	20736.800	1	20736.800	9.122	**0.007**
Within Groups	40919.000	18	2273.278		
Total	61655.800	19			

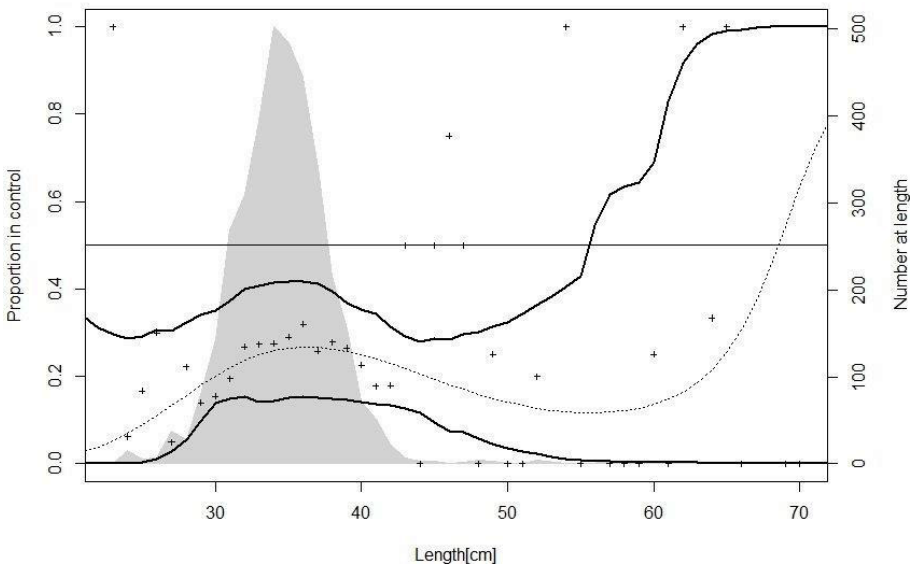

Figure 6.9-2 Catch comparison analysis for haddock in trials with low lift trawl.

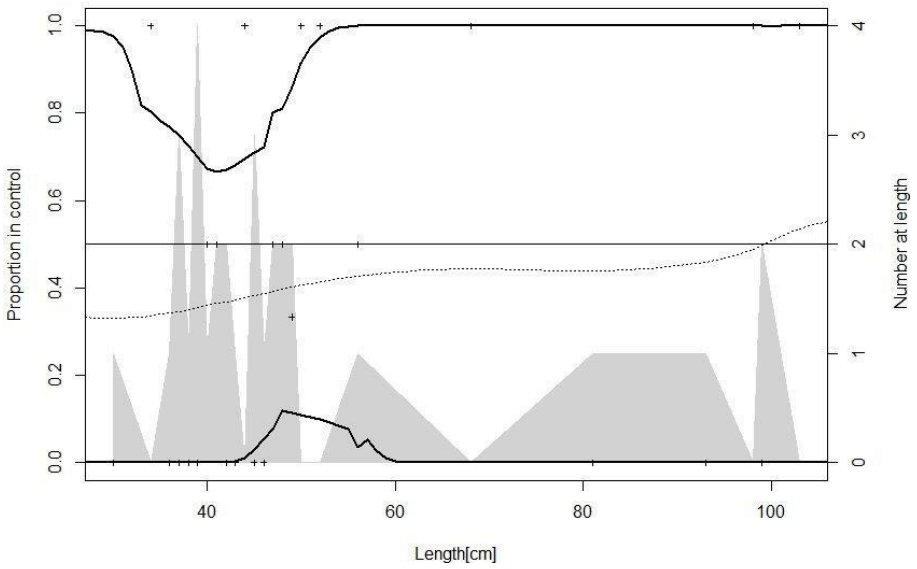

Figure 6.9-3 Catch comparison analysis for cod in trials with low lift trawl.

Separator trawl

This trial explored the concept of separating haddock from other species using a horizontal separator trawl terminating in two 80mm codends. Around 90 % of haddock and squid and 73 % of whiting were separated into the upper codend, while other commercial species were retained in the lower codend. For these two species, catch comparison analysis was reported only for haddock (Figure 6.9-4). The trial was not successful in separating haddock from squid. Although squid could not be separated from haddock, there is still potential to develop the separator trawl design by modifying the selectivity of the upper codend. The separation of haddock and whiting from other catches by the separator trawl is another opportunity to make trade-offs when choosing between gears with the introduction of the Landing Obligation.

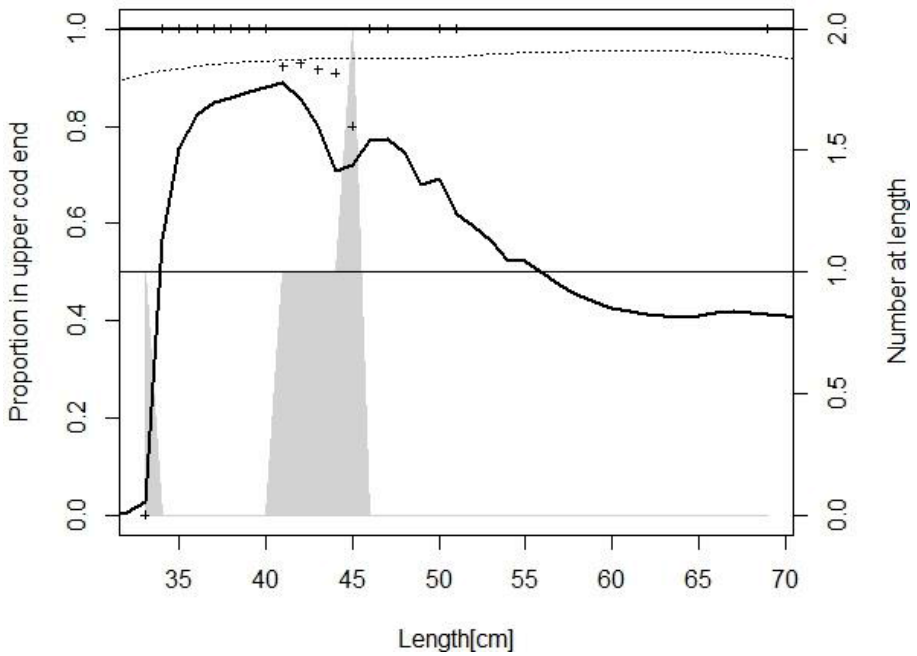

Figure 6.9-4. Catch comparison (proportion in the upper codend) analysis for haddock in trials with low separator panel.

STECF conclusions

SM120: STECF notes that the primary aim of the research was to evaluate the performance of a 120mm square mesh panel which was recently introduced into EU legislation in ICES sub divisions VIIf, g and northern VIIj replacing the existing 100mm square mesh panel (Regulation (EU) 2015/741). STECF notes that despite the increase in the panel mesh size to 120mm, the trials demonstrated only minor changes in selectivity for haddock, however it is noted that the experiment is based on limited number of hauls. STECF is unable to draw any statistically robust conclusion as to whether the recently introduced 120mm square mesh panel offers any additional improvements in selectivity for cod and whiting, as catches were low for both the species.

Low lift trawl: STECF notes that the trawl design provides an effective option for improvements in haddock selectivity with large and significant reductions in the retention of haddock of 20-55cm in length. Furthermore, catches of cod and whiting were reduced by 38 and 84 %, respectively however, the reduction for cod was not statistically significant ($p = 0.711$) and STECF is unable to draw any conclusions for this species, while it was highly significant for whiting ($p < 0.01$).

Separator trawl: STECF notes that the concept of separating haddock from other species using a horizontal separator panel was successful with ~90 % of haddock and ~73 % of whiting being separated into the upper codend, while other commercial species were retained in the lower codend. STECF notes that the trials were simply aimed at demonstrating the principle of separating different species with a view to further develop the size selective properties of the gear. STECF therefore concludes that modification does not comply with the prisons laid out in EC 737/2012 because the selectivity of the upper codend was not modified

as this was not the objective of the trials, therefore no differences in the total catch composition between traditional and experimental trawl were observed. Until such time that further works to improve size selectivity STECF is unable to provide conclusions on the utility of this gear with respect to improving the selectivity for cod, haddock and whiting.

6.10. Spurdog pilot project to minimise discards

Background

In PLEN 14-03 STECF evaluated a request from the UK on the application of a discard minimisation project for spurdog. The STECF considered that dependent upon the results of the pilot programme that a Real Time Incentive (RTI) system might provide better information on by catches, improve data collection and an incentive for self-regulation. STECF identified in their response their assumptions in assessing the project and also identified their concerns.

In summary the STECF concluded that with the information available at present, there is no scientific basis to reliably predict whether the proposed pilot project is likely to deliver any conservation benefits for spurdog.

In their advice in 2013, STECF noted (PLEN 13-03) for spurdog that 'model projections show that a TAC up to 1422 t (the last non-zero TAC) would allow the population to grow in the future at a similar rate to that forecast with a zero TAC (i.e. 28% increase in biomass in 10 years instead than 33% with a zero TAC).'

The UK have now undertaken a pilot project on the management of spurdog, and have provided this with the background information below.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Request to the STECF

STECF is asked to evaluate the outcomes of the UK pilot project on the management of spurdog, in particular drawing conclusions on whether:

- The pilot project has sufficiently addressed the points raised in their previous STECF advice (PLEN-14-03);
- The spurdog avoidance tool, if used within the proposed parameters, would provide a pragmatic solution to current dead discarding by allowing for the retention of spurdog whilst reducing overall fishing mortality.

The STECF is further asked to advise on a possible bycatch allowance that would be consistent with maintaining catches within MSY requirements. In addition the STECF is asked to advise on any additional measures that should be incorporated into any scheme to ensure stock recovery.

STECF comments

STECF considers that the proposal from the UK for an approach to manage dead discards of spurdog has sufficiently addressed the points raised in previous STECF advice (PLEN-14-03);

STECF agrees with the ICES advice that targeted fisheries for spurdog should be avoided and by-catches should be minimised (ICES, 2014). STECF considers the UK proposal as described could potentially aid the rebuilding of the stock of spurdog by promoting avoidance behaviour, which may in turn lead to reductions in fishing mortality. However, the true effectiveness of the project cannot be evaluated a priori but only after the plan has been implemented. In order to promote a reduction in fishing mortality through discard avoidance, provisions to opt into the project should be expanded to include additional vessels and MS.

If managers wish to set a non-zero TAC to permit landings of a limited quantity of spurdog that are dead when caught, STECF notes that, according to latest ICES medium term forecast, catches at the level of the most recent TAC (i.e. 1,422t in 2009) are predicted to result in a 27% increase in stock biomass of the North East Atlantic spurdog stock after 10 years whereas a zero catch is predicted to give rise to a 32% increase in stock biomass. However, STECF notes that at present, spurdog is not included in any discard plans and because vessels that do not opt into the UK approach will be able to continue discarding catches of spurdog, it is likely that realised catches will exceed any agreed by-catch TAC.

6.11. By-catches of undulate ray in IX

Background

In February 2015 the STECF issued an advice on possible by-catch provisions for undulate ray in ICES areas VIIde, VIIIab and IX (STECF-15-03). In its advice the STECF concludes that as *"there are no historic catch estimates available for the undulate ray stock in IXa and there are no fishery independent data available to determine trends in abundance (...)"* the *"STECF is therefore not in a position to provide any landings advice for the management of this stock given the lack of information available"*. The ongoing research project on undulate ray by IPMA (Projecto UNDULATA N°31-03-01 FEP186) allowed the estimation of historical landings of undulate ray. In July 2015 these estimates were presented to ICES working group on elasmobranch fishes (WGEF).

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Request to the STECF

The STECF is requested to assess the quality of the information on estimates of historical landings of undulate ray in ICES area IX. In light of this assessment, the STECF is requested to reconsider its advice of February 2015 aforementioned and advise on possible by-catch provisions for undulate ray in ICES area IX.

STECF response

Historically, in Portuguese continental waters, *Raya undulata* has been mainly caught by polyvalent vessels operating with different types of gears, close to shore, in several types of habitats and locations throughout the year. In the reported official landings, all species from the family Rajidae have always been designated under a generic category that encompasses several species, which constitutes a limitation to the use of official data for reporting historical landed weight and abundance of the different species.

Given these issues, STECF concluded in previous reports (15-03) that given the lack of historic catch estimates available for the undulate ray stock in ICES area IXa and the lack of fishery independent data to determine trends in abundance, STECF was not in a position to provide any landings advice for the management of this stock.

STECF notes ICES WGEF REPORT 2015 provides estimates of the landings of the *Raja undulata* in area XIa. These were obtained from aggregated multispecies landings following the procedure proposed by Shelton *et al*. (2012). The procedure included the adjustment of a Bayesian hierarchical GLM model that allows for the estimation of species composition and the corresponding uncertainty levels. STECF considers that the method used is appropriate. The results are presented in Table 6.11-1:

Table 6.11-1 Estimated median total landed weight of *Raja undulata* and percentiles 2.5% and 97.5% for the period 2003-2008.

Year	median	P2.5	P97.5
2003	164.3	137.1	197.0
2004	197.0	164.2	235.8
2005	171.7	141.2	208.4
2006	271.3	232.6	315.1
2007	156.7	132.3	185.6
2008	208.3	178.4	243.4

Source: Maia *et al.* 2015. Project UNDULATA - *Raja undulata* estimation of historical landings in Portugal mainland (ICES Division IXa)

In the light of this information STECF notes that the estimated median landings of undulate ray from ICES division IXa were between 156t and 271t. Based on precautionary considerations, STECF suggests that this should be set at levels substantially below the pre moratorium landings estimate. STECF notes that currently there are no survey or fishery data available that can be used to determine trends in abundance in the undulate ray stock in ICES Division IXa. STECF is therefore unable to provide any basis that can be used to set a species specific TAC for this stock. If managers wish to set some level of TAC, STECF suggests a precautionary starting point could be to set a landings limit of << 40t (20% of the estimated average median landings of the pre-moratorium period) and to adjust this as more data and information becomes available e.g. CPUE.

STECF notes that it is not in a position to determine whether such landings levels are in accordance with the provisions of the CFP. If managers decide upon a limited TAC then STECF advises that catches and effort be closely monitored and used as the basis of an adaptive management approach. STECF reiterates its comments from 2015 that if managers decide to permit a limited by-catch or sentinel fishery, then spatial and temporal catch and effort data must be collected. This should include details of total catches of undulate ray (landings plus discards), gear parameters (including soak time/tow duration) and any other parameters that the relevant scientific institutes consider necessary. Furthermore, an extension of existing survey coverage or the development of a dedicated survey should also be considered in order to develop a fishery independent time series of abundance.

6.12. Methodology to assess fishing strategies and economic results of EU fleets involved in high seas fisheries or in fisheries located in third coastal States' EEZs

Background

Several studies were published in the past years on the fishing strategies and the economic performance of the EU external fleet (for instance: Oceanic Développement, 2008. *Etude sur la flotte externe de l'Union européenne.* Rapport final Contrat FISH/2006/02. Bruxelles, 154 p. and Ifremer, Cemare, CEP, 1999. *Evaluation des accords conclus par la Communauté européenne*. Rapport final Contrat n°97/S 240-152919. Bruxelles, 181 p. +annexes). Through the Annual Economic Reports, STECF has also compiled information on several other segments which might technically be considered as part of the EU external fleet.

However, none of these studies or the AERs appears to be based on the same definition on the same concepts of what should be considered in the scope of the EU external fleet. Several criteria have been used by different authors to select vessels and/or segments to be taken into account when designing the boundaries. Such criteria might be grouped according to three main approaches,

- Geographical considerations (e.g. FAO area 21 or 37 were sometimes included, sometimes excluded),
- Fishing vessel characteristics, such as overall length (e.g. criterion linked to vessels of more than 24 m Loa sometimes applied, excluding consequently part of the fishing fleets registered in specific EU regions and fishing outside EU fishing areas, such as Andalusia, Reunion Island);
- The share of fishing activities registered inside and outside the EU fishing zones (e.g. ceilings fixed at 50 %, with no further explanations or statistical justifications).

None of these three approaches, even when combined, were sufficient to capture all the fishing vessels or all the segments involved in external fisheries. Therefore and with the aim to adopt a common and consistent methodology when assessing fishing strategies and the economic performance of EU fleets involved in high sea fisheries or in fisheries located in the waters of third countries, the Commission would like to receive recommendations from the STECF on how to define the boundaries of the external fleet, bearing in mind its diversity in consisting of fishing vessels of different segments, deploying different métiers in several fishing areas based within and outside the EU as well as from the outermost regions, involved in coastal or high-sea fisheries, targeting a variety of species.

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Request to the STECF

STECF is requested to carry out an initial scoping exercise that informs on the best approach to defining the external fleet including the possible methodologies, information requirements and time schedule needed to address this specific question.

STECF observations
To date, STECF has not been asked to provide a detailed description of fleet segments fishing in external waters. The challenge of distinguishing these vessels from the remainder of fleet is that, in many years, some vessels fished in both external and EU waters. For each vessel and each year, the percentage of activities inside and outside of EU waters may differ. Further complication arises due to boundaries overlapping. The DCF deals with vessels operating in FAO areas 27 and 37, some of which areas are EU waters and some of which are external waters.

STECF observes that, within each FAO region, vessels for which economic data in the Annual Economic Report (AER) are provided, form part of defined fleet segments not differentiated by their activities inside or outside EU waters. The definitions of these fleet segments are based on the main fishing gears used and on length classes.

In the AER, the following definition is applied to the 'EU distant water fleet':
"These regions, collectively termed "Other Fishing Regions" (or OFR) encompass all fishing areas outside the North East Atlantic (FAO AREA 27) and Mediterranean & Black Sea (FAO AREA 37), including EU-waters in outermost regions (except for the Azores region, which is included in FAO AREA 27) and non-EU waters (international waters/high seas and EEZs of non-EU countries, including Northwest Atlantic (FAO AREA 21), non-EU FAO AREA 37 and the Eastern Arctic region)" (STECF 15-07: 135).

However, STECF observes that only vessels over 24m in length are reported under 'Other Fishing Regions'. Fleet segments are included in the overview when more than 50% of their catches are reported from the regions listed above.

STECF observes that it should be possible under the current provisions of the DCF for MS to report both the total annual activity and the external waters only activity of all vessels that fished at least one day outside EU waters in each calendar year. From data already collected by MS, it would be possible to report effort, gear type, landings volume by species and income for the entire year's activities of these vessels. These variables could also be reported only for fishing undertaken in external waters. Operating costs for activities outside EU waters would have to be estimated.

STECF observes that although economic data are not collected on the same disaggregated level as biological, effort and landings data, it is possible to use models to estimate economic variables at the same disaggregated levels. In particular, economic data is usually collected and presented at annual level, encompassing the entire annual activity of a vessel, but it is possible to estimate the costs and revenues attributable to activity of a vessel in different sea areas during the year if sufficiently disaggregated data are available to the MS.

STECF observes that current DCF fleet segment criteria ensure that each vessel can be included in only one fleet segment for each calendar year. This system for allocating vessels to segments means that any vessels that fished in external waters as a minority activity are included in "standard" DCF segments and not in Other Fishing Regions segments. It could be determined that all vessels that fished any days in external waters are included in an external waters segment. Those vessels that only fish a minority of days in external waters may also be included in the more standard DCF segments according to their majority activity. Therefore,

in order to avoid double counting of vessels and fishing activity, when presenting figures on the external waters segment, it would be necessary to report number and activity of vessels that were also included in other DCF fleet segments.

STECF observes that there may be some MS which have very few vessels that fished in external waters in a reference year. In these cases, the MS would be unable to present figures for these vessels as a segment because of the risk that individual vessels may be identified from the segment level data. If this situation occurs, it could lead to the exclusion of these vessels from estimates for all EU vessels that fished in external waters.

STECF conclusions

STECF concludes that two steps are necessary to be able to answer the request:

1. First, a standard term should be agreed and defined for "fishing activity outside the EU waters" (also variously described as long distance fleet and fishing in external waters). Then, criteria should be developed to identify such activity using the current DCF data.
2. Second, identify and test methodologies to disaggregate the economic data relating to external waters activities, to be able to assess the economic performance of the fleet. Elaborate advantages, disadvantages and caveats of methods considered

STECF concludes that an expert working group would be a suitable means of conducting the work required to develop, test and agree a method for reporting on fishing strategies and economic performance of EU vessels that are engaged in fishing in external waters for some or all of each year.

6.13. Conformity of certain Mediterranean national management plans with the Common Fishery Policy

Request to the STECF

The STECF is requested to review, evaluate the findings and make any appropriate comments and suggestions on the assessment carried out by MAREA15 on the conformity of the national management plans for bottom trawlers in Greece and Cyprus and for purse seiners in Greece with the requirements of the Common Fisheries Policy.

The STECF is requested to review, evaluate the findings and make any appropriate comments and suggestions on the assessment carried out by MAREA[16] on the conformity of the national management plans for bottom trawlers in Greece and Cyprus and for purse seiners in Greece with the requirements of the Common Fisheries Policy.

15 MAREA, Framework Contract MARE/2009/05, Lot I. Specific Contract n° 9 (SI2.651082) - Task 4, *Ad hoc* scientific advice in support of the implementation of the Common Fisheries Policy.

16 MAREA, Framework Contract MARE/2009/05, Lot I. Specific Contract n° 9 (SI2.651082) - Task 4, *Ad hoc* scientific advice in support of the implementation of the Common Fisheries Policy.

STECF has been asked to comment on whether the National Management Plans (NMPs) contain the following 14 specific elements:

1. Part A.1. Scope, in terms of stocks, fishery and geographical area
2. Part A. 2.1. Sustainable fishing activities in the long term
3. Part A. 2.2(a). Precautionary approach
4. Part A. 2.2(b). Maximum Sustainable Yield approach
5. Part A. 2.3. Ecosystem- based approach
6. Part A.3. Quantifiable targets such as fishing mortality rates and/or spawning stock biomass (yes)
7. Part A.4. Clear time frames to reach quantifiable targets
8. Part A.5 Conservation reference points
9. Part A.6 . Safeguards to ensure that quantifiable targets are met, as well as remedial action, where needed, including for situations where the deteriorating quality of data or non-availability put the sustainability of the stock at risk.
10. Part A.7. Conservation and technical measures to be taken in order to achieve the target sets out under the landing obligation.
11. Part A.8. Minimisation of Unwanted catches
12. Part A.9. Indicators for periodic monitoring and assessment of progress in achieving the targets of the plan
13. Part A.10. Fish stock recovery areas
14. Part A.11. Collection of Scientific data

While the 2nd element (part B) provides additional comments on each of the elements above

Part B. Describe possible conservation and technical measures to be integrated in the management plan in order to attain the missing elements identified in the previous table and to achieve the objectives of the Common Fisheries Policy (max. 2 pages)

Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

STECF observations on individual plans

GSAs 20, 22 and 23 –GREEK TRAWL FISHERY

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MANAGEMENT PLAN FOR GREEK BOTTOM TRAWLERS

STECF observations

Of the fourteen elements assessed (part A), the ad-hoc report notes that nine of them were considered as present and well described in the plan, one as partially described and four were considered as absent in the Plan.

1.Part A.1. Scope, in terms of stocks, fishery and geographical area

A large number of species are exploited by the Greek trawl fisheries. However, data are only available for red mullet, striped mullet, picarel, hake, and deepwater rose shrimp only. Furthermore, catch and landings data by species are absent and the most recent stock assessments are from 2009. Data for all the other species listed in Appendix XII of the DCR (now in Appendix VII of the DCF) are absent.

The ad hoc contract notes that the scope in term of areas Aegean (GSA 22), Cretan (GSA 23) and Ionian (GSA 20), fishery (bottom trawl) and stocks (mixed demersal species) is clearly defined.

STECF notes that it is not possible to determine whether the scope of the plan covers all the relevant species as no information regarding catch composition or catch rates has been provided in the ad hoc contract.

2. Part A. 2.1. Sustainable fishing activities in the long term

The ad hoc contract notes that the objective of the plan is an improvement in the spawning stock biomass of the species contained within the scope of the NMP. The NMP notes that, since the 1960s permanent or seasonal closures have been applied in certain regions, mainly mouth rivers and gulfs in the Aegean (GSA 22), Cretan (GSA 23) and Ionian (GSA 20). According to existing Greek legislation, the bottom trawl fishery in the national waters is already closed from June to September (4 months) and an additional 15-days closure of the bottom trawl fishery in the Aegean (including Cretan) and Ionian seas split equally in December and May.

STECF notes that while such measures can reduce exploitation rates and may have had a positive effect on the status of the stocks historically, it is not possible to determine the contribution these closers have had on controlling fishing mortality. Furthermore, it is unclear how the additional 15 day closure will be implemented and distributed between December and May e.g. 7.5 days for each month or 15 days for each month.

Given the general paucity of analytical stock assessments, STECF is unable to determine whether the objectives are consistent with long term sustainability of fishing activity.

The ad-hoc contract notes that the NMP, in accordance with the Art. 2, point 1 of the EU reg. 1380/2013 indicates that the proposed measures will not have serious socio-economic implications, therefore the fishing activity will be economically and socially sustainable in the long-term. STECF notes that no quantifiable information or data on the economic status and social implications is provided, thus the conclusions regarding the socio-economic implications are therefore result speculative.

3. Part A. 2.2(a). Precautionary approach

The NMP states that, based on the monthly allocation of fishing effort, the half-month closure of the bottom-trawl fishery corresponds to a 6.3% reduction of the total trawlers' fishing effort. For the artisanal metiers, given that February is a month of relatively high activity for them it is estimated that this closure will reduce their total effort by ~10%. The ad hoc

contract considers that the implementation of effort reduction, especially in deeper waters, could be considered to be in line with the precautionary approach.

STECF has no means of assessing how such reductions are likely to impact on fishing mortality but considers that such reductions in effort are unlikely to deliver the reductions necessary to achieve any potential Fpa reference points in fishing mortality without additional measures.

4. Part A. 2.2(b). Maximum Sustainable Yield approach

Due to lack of data since 2009, the analysis of the stock status presented in the NMP is not updated and is based on the outcomes from dynamic (surplus production) model approaches. The results presented in the NMP differ significantly to those presented in STECF (SGMED-08-03) for the species considered (red mullet, striped mullet, picarel, hake and pink shrimp). Given, however, that the current assessments use data only up to 2009, neither the data presented in the NMP or STECF provide a perspective of current (relative) exploitation or stock biomass. STECF (SGMED-08-03) noted that "the results should only be taken to be an indication of the trends in exploitation status and stock biomass over the historic time series and may not be representative of the current status". Unfortunately, the lack of implementation of DCF in the recent years does not allow up-to date estimates on the state of the stocks.

The ad-hoc report notes that a non-equilibrium Schaefer production model was applied in the Aegean (including Cretan) and Ionian seas for each of the main demersal species exploited by bottom trawl fleets using landing data of the period 1990-2009 and the estimated standardized indexes of the "MEDITS" surveys for years 1994-2008. The model estimated yearly biomass (B) and fishing mortality (F) ratios in relation to MSY levels, as well as landings in relation to MSY. On the other hand, Mediterranean EWG-STECF assessment results differ markedly from those obtained in the in the NMP. The result presented indicate that for the assessed stocks, fishing mortality relative to F_{MSY} is close to optimum levels and stock biomass for all species are estimated to be in excess of B_{MSY} (in 2009). STECF considers that this is presents an overly optimistic view of the stock and exploitation status and should be treated with caution. Furthermore STECF considers that and that the assessments require peer review through a benchmarking process before they should be considered for management purposes.

Given the lack of data and assessments since 2009, and general concerns regarding the potentially optimistic results from the surplus-production models, STECF considers that the NMP is not consistent with the objectives of article 2.2. Regulation (EU) No 138/2013 and that the existing targets should be replaced using the latest F_{MSY} proxy obtained in new updated assessments when available.

5. Part A. 2.3. Ecosystem- based approach

The NMP does not consider any measures related to Art.2 (3) of the EU reg. 1380/2013 regarding the potential impact of bottom otter trawl fishery on the ecosystem. No information is presented relating to catch composition or catch rates. The NMP only indicates discard ratios of non-commercial and commercial species ranging respectively between 28-35% and 0-11% depending on the area and the season. The ad hoc contract notes that further

conservation and technical measures to reduce the impact on the ecosystem are required and that the NMP should take into consideration specific measures that minimize benthic impact The ad hoc contract also notes that incentives to promote fishing with low impact on the marine ecosystem and pilot projects on alternative types of fishing management techniques and on gears that minimise the negative impact of fishing activities on the marine environment should also be considered.

6. Part A.3. Quantifiable targets such as fishing mortality rates and/or spawning stock biomass

The ad hoc contract notes that reference levels determined for each species and the targets of the management plan are expressed in terms of fishing mortality (F) and population size (biomass, B). For the stocks under the scope of the NMP, the ratio of $F/ F_{MSY} =1$ is considered to be the limit reference point (maximum permissible exploitation ratio).

Given that the assessments carried out are based on data up to 2008 only, STECF considers that the results should only be taken to be an indication of the trends in exploitation status and stock biomass over the historic time series and may not be representative of the current status.

While the ratio of F/F_{MSY} can be considered an appropriate reference point, given the reservations regarding the utility of surplus production models (PLEN 12-03) and the lack of recent data, STECF considers that the estimates of F/F_{MSY} and B/B_{MSY} identified in the NMP are highly uncertain and should not be used for management purposes and that these should be updated in light of new scientific advice.

7. Part A.4. Clear time frames to reach quantifiable targets

The NMP does not indicate a clear time frame to reach the quantifiable targets. The ad hoc contract identifies this element as not being fulfilled.

STECF therefore considers that in the future development of a regional management plan for these stocks, PA and MSY reference points for F and SSB should be developed. STECF notes that the plan was implemented before the recent reform of the CFP and therefore the target dates laid down in the plan are outdated with respect to achieving the maximum sustainable exploitation rate by 2015 where possible and, on a progressive, incremental basis at the latest and by 2020.

STECF agrees with the ad hoc contract that the timeframe to meet these targets as specified in the NMP need to be updated.

8. Part A.5 Conservation reference points

The ad hoc contract notes that the conservation reference points are set for the main demersal stocks exploited by bottom trawl fishery in term of B_{MSY}. It is deemed that the ratios biomass (B) to biomass for maximum sustainable yield (B_{MSY}) should not be lower than 1, i.e. the ratio of $B/B_{MSY} =1$ is considered to be the conservation reference point and expresses the minimum permissible stock biomass value. An updating of the conservation reference points taking into account of uncertainty is proposed.

STECF notes that while the ratio of B/B_{MSY} is an appropriate reference point, safeguard reference points e.g. $B_{MSY}/BMSY_{trigger}$ reference points should also be established and used as the basis to prompt remedial management actions, for example through some form of Harvest Control Rule (see below).

9. Part A.6. Safeguards to ensure that quantifiable targets are met, as well as remedial action, where needed, including for situations where the deteriorating quality of data or non-availability put the sustainability of the stock at risk

The ad hoc contract notes that the NMP states that in cases where the annual estimates of the ratio F/F_{MSY} exceeds the value of 1 for any of the stocks under its scope, supplementary management measures will be taken including relevant additional fishing effort limitations in the form of temporal restrictions on fishing operations. Some simulations are presented for hake and pink shrimp, which evaluate the impact of additional closures may impact the species in terms of fishing mortality and

STECF notes that while the objective to introduce additional spatial/temporal closures and simulations have shown "that [this] will result in effort reductions, not only of the bottom-trawl fleet but also of the long-line and static-net metiers of the multi-license artisanal fleet that target hake" and in circumstances where $F/F_{MSY} > 1$ and $B/B_{MSY} < 1$ additional fishery closure may be implemented. While these reference targets are consistent with 1380/2013 (notwithstanding the previous concerns regarding the robustness of the analytical approach), STECF notes the absence of up to date analytical assessments on which to base such actions means that mangers have no objective basis to trigger the introduction of such supplementary measures.

Given that no DCF data has been collected between 2009 and 2012 and the lack of recent analytical assessments, STECF considers that there is an ongoing and substantive deterioration in quality and availability of data and that the NMP does not appear to include measures to deal with such conditions. The NMP includes provisions for fishery monitoring, but given the lack of data between 2009 and 2012, STECF considers that these provisions have not been fulfilled. .

10. Part A.7. Conservation and technical measures to be taken in order to achieve the target sets out under the landing obligation.

The ad-hoc contract notes that The NMP does not contain provisions for the implementation of the landing obligation. (Art. 15 EU reg. 1380/2013) There is little information on discards of the species potentially subjected to landing obligation. The ad-hoc contract recommends that a strengthened monitoring, control and surveillance must be integrated. The ad hoc contract considers that measures should include the monitor of fishing operations and catches, particularly through vessel monitoring systems, on-board observers and, when possible, fully documented fishery.

STECF notes that NMP has been adopted before the entry in force of the EC Reg. 1380/2013, therefore the aspects related to landing obligation (estimation/characterization of discards and to the discard practices) have not been included. STECF notes that Article 15.1(d) of

Regulation (EU) No 1380/2013 specifies that from 1 January 2017, the species which define the fisheries will be subject to the landing obligation and that from 1 January 2019 at the latest all other species should be covered. STECF considers that the fisheries and the species to be affected by the Landing Obligation should be specified in the revised NMP, in accordance with the provisions of Article 15.5.

11. Part A.8. Minimisation of Unwanted catches

The NMP presents discard ratios for the four species specified in the NMP. The ad hoc contract notes that the NMP does not propose any measure for the minimisation of unwanted catches.

STECF notes that there is no information presented regarding the full species composition of the landings or the discarded components of the catch and no specific measures to minimise the unwanted catches have been proposed.

12. Part A.9. Indicators for periodic monitoring and assessment of progress in achieving the targets of the plan

The ad hoc contract notes that an evaluation will be carried out of stocks of the main species targeted by trawl net fishing, i.e. hake (*Merluccius merluccius*), red mullet (*Mullus barbatus*), striped mullet (*Mullus surmuletus*), picarel (*Spicara smaris*) and pink shrimp (*Parapeneus longirostris*) in the Aegean (GSA 22), Cretan (GSA 23) and Ionian (GSA 20) Seas on an annual basis, in order to establish the status of the stocks based on the reference levels determined for each species.

STECF notes that no specific economic and social indicators have been identified for the periodic monitoring and assessment of the plan. STECF notes that biological and economic indicators are necessary for the effective implementation and ongoing evaluation of the NMP to determine how the plan is performing relative to specified objectives. Without specific details of the indicators, STECF is unable to assess whether these are relevant or appropriate for monitoring progress towards the objectives of the plan.

13. Part A.10. Fish stock recovery areas

The ad hoc contract notes that the NMP contains the details of a number of seasonal and permanent closures that have been in place since the 1960s in the Aegean (GSA 22), Cretan (GSA 23) and Ionian (GSA 20). The NMP proposes additional closures (15 days) as well as fishery closures if the ratio of $B/B_{MSY} < 1$. The ad hoc contract suggests the establishment of additional biologically sensitive protected areas and that the NMP should propose additional biological sensitive protected areas in order to comply with article 8 of the EU reg. 1380/2013.

STECF agrees with the ad hoc contract observation that it is not possible to determine the efficacy of the existing measures.

14. Part A.11. Collection of Scientific data

The ad hoc contract the NMP notes that the trawl fleets will be closely monitored through the Greek Fisheries Data Collection Program established in accordance with EC 93/2010 Regulation. Monitoring will include concurrent at-market and at-sea sampling carried out on monthly and quarterly basis respectively. In addition, fishery independent surveys will continue through annual "MEDITS" bottom-trawl survey. All monitoring activities, including the "MEDITS" survey, will cover all areas exploited by the Greek fleets, i.e. Aegean, Cretan (GSAs 22 and 23) and Ionian seas (GSA 20). The NMP is supported by the provisions of the EU Data Collection Framework (Regulation (EC) No 199/2008).

Part B. Describe possible conservation and technical measures to be integrated in the management plan in order to attain the missing elements identified in the previous table and to achieve the objectives of the Common Fisheries Policy (max. 2 pages)

STECF notes that additional and more detailed comments have been provided in the ad hoc contract. These are summarised in the responses provided above.

MANAGEMENT PLAN FOR PURSE SEINERS IN GREECE

The MP refers to the Greek purse seiners operating in the Greek seas (Aegean and Ionian Sea) targeting anchovy and sardine stocks.

STECF observations

Of the fourteen points assessed (part A), the ad-hoc report considers that nine of them were considered as present and well described in the plan and five were considered as partially or not present in the Plan.

1. Part A.1. Scope, in terms of stocks, fishery and geographical area

STECF notes that the scope in terms of the stocks to be covered (two genetically different stocks of anchovy, the Aegean sea stock and Ionian Sea stock; and the sardine stock, the same stock in both seas), the fishery and geographical area (Greek waters, Aegean and Ionian Seas) are identified. As stated in the NMP, "the objective is the sustainable exploitation of anchovy and sardine stocks and to support derogation from the provisions of paragraph 3 of article 13 of the Reg. (EC) 1967/2006 in accordance to paragraph 5 of the same article in relation to the minimum distances and depths and other measures". The NMP provides information aimed at justifying the fishing activity to be extended to depths between 30- 50 m.

2. Part A. 2.1. Sustainable fishing activities in the long term

The NMP states that the monitoring of the state of the stocks in relation to the reference points will be conducted on an annual basis. Fishing permits will be revoked the following fishing season if the RPs are exceeded. The monitoring plan includes acoustic surveys for anchovy and sardine and monthly monitoring of the landings and the biological characteristics of the landed individuals. The NMP indicates that RPs were set based on data derived from echo-sounding and ichthyoplankton research (point 3.5) and on Exploitation rate $E < 0.4$ (Patterson 2004).

The ad-hoc contract notes that the NMP contains socio-economic considerations regarding the application of the regulation EC 1967/2006 (section: "Financial impact from the application of the Reg. (EC) 1967/2006 on the purse seine fishery in Greece"). The primary socio-economic considerations contained in the plan are mainly focussed on the impact of the technical regulations relating to the operation of purse seines.

Given the absence of updated information, STECF is unable to determine whether the objectives are consistent with the objectives of achieving sustainable fishing activities in the long term.

3. Part A. 2.2(a). Precautionary approach

The ad hoc contract identifies this element as being fulfilled. Current legislation identified in the NMP includes a closed season from mid-December to the end of February and the prohibition of fishing two days before and two days after full moon. The NMP proposes the minimum estimated SSB in June as RP (26,000 t). This approach was not proposed for sardine.

STECF notes that the basis of the proposed PA reference points for anchovy of 26,000t is unclear and requires further clarification. STECF considers that in the future development of a regional management plan for these stocks, PA and MSY reference points for F and SSB should be derived.

4. Part A. 2.2(b). Maximum Sustainable Yield approach

The NMP includes the latest assessments available (2009). In relation to the defined exploitation rate E, at the time, $E_{anchovy}$ was below 0.4 and $E_{sardine}$ above 0.4 (SGMED 2008; GSA 22). Yield per recruit analysis was performed in 2008, but was not considered reliable.

STECF agrees with the ad hoc contract that the reference points in the NMP should be updated and the possibility to estimate MSY reference points or adequate proxies for the target stocks requires further exploration.

5. Part A. 2.3. Ecosystem- based approach

Discards consist mainly of pelagic species and represent between 3 and 8% of the total catch. According to available information, the most discarded species is *Sardinella aurita.*

The NMP evaluates the potential benthic impact and on demersal species, and concludes that the impact is minimal. In addition, the technical description of the use and operation of the purse seine gear are provided as support for the derogation on the minimum distances and depths for the operation of the fishing gear, to allow fishing at depths between 30 and 50 m.

STECF notes among the discarded species (Table 11 in page 16), the presence of a number of demersal species is mentioned (e.g. *Lophius budegassa, Squilla mantis, Penaeus kerathurus*),

which would suggest that sometimes the fishing operation might take place in contact with the bottom.

6. Part A.3. Quantifiable targets such as fishing mortality rates and/or spawning stock biomass

Targets are proposed in the NMP in terms of exploitation rate below 0.4. For anchovy SSB, a RP of 26,000t is proposed, indicating that the continuation of SSB estimates in the forthcoming years will allow B_{lim} reference point.

STECF notes that the basis of the proposed PA reference points for anchovy of 26,000t is unclear and requires further clarification and agrees with the ad hoc contract that the reference points require updating with the most recent scientific advice.

7. Part A.4. Clear time frames to reach quantifiable targets

The NMP does not indicate a clear time frame to reach the quantifiable targets. The ad hoc contract identifies this element as not being fulfilled.

STECF therefore considers that in the future development of a regional management plan for these stocks, PA and MSY reference points for F and SSB should be revised. STECF notes that the plan was implemented before the recent reform of the CFP and therefore the target dates laid down in the plan are outdated with respect to achieving the maximum sustainable exploitation rate by 2015 where possible and, on a progressive, incremental basis at the latest and by 2020.

STECF agrees with the ad hoc contract that the timeframe to meet these targets as specified in the NMP need to be updated.

8. Part A.5 Conservation reference points

The ad hoc contract notes that it is not clear if the minimum estimated SSB is set as a reference point (SSB = 26,000t) for anchovy. No minimum SSB is provided for sardine.

9. Part A.6 . Safeguards to ensure that quantifiable targets are met, as well as remedial action, where needed, including for situations where the deteriorating quality of data or non-availability put the sustainability of the stock at risk.

The ad hoc contract notes that the status of the anchovy and sardine stocks will be assessed annually. In the eventuality that reference points are exceeded, licences will be revoked the following fishing season.

STECF notes that no remedial action is foreseen for situations of deteriorating quality or non-availability of data.

10. Part A.7. Conservation and technical measures to be taken in order to achieve the target sets out under the landing obligation.

The NMP was developed and implemented prior to the adoption of the current CFP 1380/2013. As such, the landing obligation is not considered in the NMP and therefore requires updating. According to the available information at the time when the NMP was submitted (data series 2003-2006), the discards ranged between 3 and 8% of the total landings. The main amount corresponded to small pelagics (basically *Sardinella aurita*, 7% of the landings in 2004) and the contribution of demersal species was less than 0.5% of the landings. Discards of the target species anchovy and sardine, both with MCRS (Minimum Conservation Reference Size), are negligible (< 1 % of landings). Almost 80% of the discarded anchovies and 60% of the discarded sardines are undersized. In case discards at present remain at these low levels, the NMP should include a *de minimis* exemption request, to ease the compliance of the landings obligation by fishermen.

Purse seine is prohibited over *Posidonia* beds and various geographic areas. The official maps of *Posidonia* beds and the Greek legislation in force in 2007 are presented in Annex V, in Greek. The date when the information on *Posidonia* beds was collected is not specified in the NMP.

Results from a study are presented to show that the purse seine operations do not cause any impact to the sea bottom and benthos (Annex IV) and has a minimal impact on the demersal species. Also, a study is proposed aimed at reducing the catch of undersized fish which are discarded.

11. Part A.8. Minimisation of Unwanted catches

According to the available information, unwanted catches were already low, with the exception of those of *Sardinella aurita* in 2004 (7% of the total purse seine landings).

12. Part A.9. Indicators for periodic monitoring and assessment of progress in achieving the targets of the plan

The monitoring is defined for one year duration. The time schedule of the monitoring activities along the year is presented (report on the status of the stock, decision on licences for the fishing season, landings monitoring, research surveys). No explanation is provided as whether the annual updating of the status of the stocks will be performed at national level or in the frame of international expert groups e.g. STECF/GFCM.

STECF notes that updated assessments are needed for the definition of updated targets and that a time frame for a multi-annual management plan has to be defined.

13. Part A.10. Fish stock recovery areas

The ad hoc contract notes that the NMP makes reference to areas where purse seining is prohibited, but no information is provided on the criteria for the choice of these areas. No explanation on the basis for the establishment of these areas, whether these are related with the purse seine target species (e.g. spawning areas, nursery areas) is provided.

14. Part A.11. Collection of Scientific data

The NMP proposes the collection of the data required for the annual assessment of the status of the stocks of anchovy and sardine (NMP section 4: acoustic surveys, landings and effort sampling on a monthly basis, collection of social and economic parameters, estimation of the spawning biomass through the Daily Egg Production Method). Sampling details are given for the acoustic surveys. Further details should be provided on the methodology that will be applied for the collection of the fishery related data, biological data and social and economic parameters. The social and economic parameters are not defined.

While the 2nd element (part B) provides additional comments on each of the elements above

Part B. Describe possible conservation and technical measures to be integrated in the management plan in order to attain the missing elements identified in the previous table and to achieve the objectives of the Common Fisheries Policy (max. 2 pages)

STECF notes that additional and more detailed comments have been provided in the ad hoc contract.

MANAGEMENT PLAN FOR THE BOTTOM TRAWL FISHERY WITHIN THE TERRITORIAL WATERS OF CYPRUS

STECF observations

Of the fourteen elements assessed (part A), the ad-hoc contract considers that all of them were present and described in the plan.

1.Part A.1. Scope, in terms of stocks, fishery and geographical area

STECF notes that the scope in terms of the stocks to be covered and the fisheries exploiting them are provided in the Plan.

2.Part A. 2.1. Sustainable fishing activities in the long term

The objective of the current plan (covering the period 2010-2013) is aimed at recovering demersal and mesopelagic stocks in the coastal zone of Cyprus and adjusting the fishing fleet to the availability of such stocks. Specifically, the main measures include the permanent withdrawal of vessels, the use of more selective fishing methods, the reduction in the number of fishing licences, the reduction in the permitted fishing tools, the creation of fishing protected areas and stricter control measures.

STECF notes that the plan includes background information on the stock assessments for the main target species: *Mullus barbatus, M. surmuletus, Boops boops, Pagellus erythrinus* and

Spicara smaris and analysis of economic data on an annual basis. Furthermore, it contains several technical measures (imposed to both the trawl and small scale fisheries) aiming at reducing pressure on demersal stocks, e.g. increases of mesh size (both in bottom trawls and small scale fishing nets), designation of fishing restriction areas, prolonged closed fishing season for trawlers (1st June – 7th November) and 50% reduction in fishing licenses (from 4 to 2 bottom trawlers).

From the elements presented in the plan, STECF is unable to determine whether it is consistent with the objective of long terms sustainable fishing activities or with article 2.2 of Regulation (EU) No 1380/2013, namely, ensuring that the exploitation of resources will restore and maintain populations of harvested species above levels that can produce the maximum sustainable yield.

3.Part A. 2.2(a). Precautionary approach

STECF considers that the technical measures included in the plan (see above: Part A. 2.1) but the efficacy of the existing technical measures have not been evaluated and the plan lacks any stock specific PA reference points..

4.Part A. 2.2(b). Maximum Sustainable Yield approach

STECF notes that F reference points related to MSY ($F_{0.1}$, F_{max}) are included in the NMP.

5.Part A. 2.3. Ecosystem- based approach

STECF notes that no consideration is taken in the MP of the potential impact of the trawl fishery on non-target species and sensitive habitats.

6.Part A.3. Quantifiable targets such as fishing mortality rates and/or spawning stock biomass

STECF notes that targets related to fishing mortality rates ($F_{0.1}$, F_{max}) are included in the MP.

7.Part A.4. Clear time frames to reach quantifiable targets

STECF notes that the NMP stipulates the evaluation of the outcome of its measures after 5 years of implementation. No clear time frames to reach F_{MSY} are presented. STECF considers that after the reform of the CFP (Regulation (EU) No 1380/2013), target dates laid down in the plan should be aligned with the principal aim of achieving maximum sustainable exploitation, at the latest, by 2020.

8.Part A.5 Conservation reference points

The MP uses $F_{0.1}$ and F_{max} as reference points. STECF note that there are no PA reference points specified in the plan and in particular, B_{pa} /$BMSY_{trigger}$ reference points are absent.

9.Part A.6 . Safeguards to ensure that quantifiable targets are met, as well as remedial action, where needed, including for situations where the deteriorating quality of data or non-availability put the sustainability of the stock at risk.

The MP states that annual stock assessments and economic analyses (not specified) will be conducted on an annual basis however the first evaluation of the plan will be carried out after 5 years of implementation. STECF notes that no remedial actions are described in cases that targets will not be met and the plan lacks limit reference points e.g. B_{pa} /$BMSY_{trigger}$ which could be used to trigger the introduction of additional measures.

10.Part A.7. Conservation and technical measures to be taken in order to achieve the targets set out under the landing obligation.

Preliminary information included in the plan indicates that *Pagellus erythrinus*, one of the target species of the trawl fishery, was discarded at a rate of 10% (in weight). STECF notes that Article 15.1(d) of Regulation (EU) No 1380/2013 specifies that from 1 January 2017, the species which define the fisheries will be subject to the landing obligation and that from 1 January 2019 at the latest all other species should be covered. STECF considers that the fisheries and the species to be affected by the Landing Obligation should be specified, in accordance with the provisions of Article 15.5.

11.Part A.8. Minimization of Unwanted catches

The ad hoc contract considers that further measures for the protection of areas with high concentrations of juveniles and sensitive habitats are required. STECF has no further information to assess the basis for such measures.

12.Part A.9. Indicators for periodic monitoring and assessment of progress in achieving the targets of the plan

See point A.6 above. Biological and economic indicators used to evaluate the plan should be clearly specified.

13.Part A.10. Fish stock recovery areas

The MP includes the designation of certain fishing restriction areas. STECF is not in a position to evaluate whether these areas will help towards the recovery of the target stocks.

14.Part A.11. Collection of Scientific data

The NMP notes that biological and economic data will be collected in accordance with the provisions of the DCF. Data from logbooks and VMS will also be collected and used.

STECF conclusions
STECF notes that many of the existing NMPs were introduced prior to the implementation of the 2013 CFP and that these should be modified so as to conform to the provisions of article 10 of Regulation (EU) No 1380/2013.

STECF has reviewed the assessment of three management plans for different fisheries in Greece and Cyprus contained in the report of the ad hoc contract. STECF notes the key findings of the ad hoc contract assessment and highlights that the analysis of each NMPs has identified specific elements that will require modification and has made suggestions on additional and new measures that could be considered so as to conform to Regulation (EU) No 1380/2013.

The following generic issues have been identified as:

STECF notes that Target Reference Points are available for a limited number of species but that many of these require updating the most recent scientific advice.

STECF notes that some of the assessments and reference points identified in some of the plans, in particular for the plan covering the demersal trawlers in Greece, are based on non-equilibrium surplus production models which are likely to present an overly optimistic perspective of the levels of exploitation and stock status and that these assessments require further peer review before they can be considered as the basis of management decisions. Furthermore, given the general issues associated with a lack of recent fishery dependent and independent data, the assessments of the stocks exploited by Greek fleets are outdated and are therefore not representative of the current stock status or exploitation rates.

STECF considers that updated, age or length based assessments are required for the objective management of all stocks concerned and updated target and limit reference points are required for all three plans. Furthermore, no clear timelines to achieve fishing mortality rates which are consistent with MSY are identified in the plans.

STECF notes that since the implementation of many of these plans, more analytical assessments have become available covering a wider range of stocks. Where appropriate these should be considered in the development of the revised plans. STECF notes that in several cases, existing fishing mortality targets are not consistent with article 2 of Regulation (EU) No 1380/2013.

STECF notes that as these plans have been developed and implemented prior to the introduction of the current CFP (Regulation (EU) No 1380/2013), they are not consistent with the provisions of the landing obligation and as such, the plans require updating, including a definition of the fleets/fisheries and species which fall under the scope of the landing obligation.

STECF notes that the plans fail to include adequate economic assessments and provision of indicators that would permit evaluation of whether the plans conform to article 2.1 of Regulation (EU) No 1380/2013, namely achieving economic, social and employment benefits,

and therefore the plans require updating and expanded. STECF also notes that the socio-economic considerations provided in the plans are generally limited.

STECF notes that an analysis of the biological and economic impact of any new management measures should be included as part of the NMP. STECF notes that in many cases the impact of the fisheries on the marine habitat is not considered within current NNMPs. STECF considers that such impacts should be considered when developing new NMP's.

While many of the required elements are identified as being present in the NMP, STECF however considers that the specifications (e.g. harvest control rules, single stock limit and management reference points of F and SSB, reductions of the catches etc.) are insufficient to reach F_{MSY} by 2020 at the latest.

Regarding the geographic scope of the plans, STECF reiterates the general conclusion that given the geo-political delineation of the existing NMP, STECF considers it likely that many stocks are transboundary relative to the current boundaries of the NMP. Given that management plans should aim to encompass the geographic scope of the stocks and the fleets exploiting them, STECF considers that broader scale regional based management plans are more appropriate and are in accordance with the precautionary approach so as to ensure that all fleets are subject to the provisions of the plans.

STECF concludes that the majority of assessed stocks in the Mediterranean are largely overexploited, with fishing mortality rates well in excess of F_{MSY} targets. STECF considers that in these cases, there is an urgent need to implement effective regional measures aimed at rebuilding these stocks.

6.14. Sampling statistics of unsorted pelagic catches

Background

In accordance with Article 19 of Regulation 2187/2005 on technical measures in the Baltic Sea

" 1. Unsorted catches shall be landed only at ports and landings sites where a sampling programme referred to in paragraph 2 is in operation.

2. Member States shall ensure that an adequate sampling programme allowing effective monitoring of unsorted landings by species is in place."

In addition, Regulation 1224/2009 (Control Regulation) requires that quantities of fish catches be recorded by species.

During previous inspection programme concerning pelagic fisheries in the Baltic Sea conducted by DG MARE it was found that MS have rather different approaches to establishing sampling programmes. Consequently, the national systems in place allow for considerable differences in sampling results. This also has big implications on the quota uptake of the stocks concerned, not only of herring and sprat but also any other species fishermen may catch during their fishing operations.

Against this background it is necessary to facilitate the national administrations in adopting appropriate and reliable sampling methodology that will yield scientifically and statistically sound results and establish harmonised rules.
Background documentation can be found on: https://stecf.jrc.ec.europa.eu/plen1503

Request to the STECF
The STECF is requested to assess whether the current sampling methodology on sampling of catches for the purpose of determining the catch composition when fishing with small meshed nets as established in Commission Regulation (EEC) No 954/87 (with special regard to Articles 4 and 7) for the North Sea and adjacent waters will lead to statistically sound estimates of catch composition and therefore be used as the basis for sampling of catches in herring and sprat fisheries in the Baltic? If not, how could the methodology be improved in terms of the level of sampling carried out?

STECF observations
STECF was informed by the European Commission that different MS use different approaches to derive species composition estimates from unsorted catches of small pelagic fish in the Baltic. The relevant EU regulations only provide the basic framework for monitoring catch composition, while the detailed implementation of sampling methodology is up to the MS and consequently open for various approaches. This might lead to a situation where the derived results on catch composition could not be comparable between MS in terms of statistical properties and validity.

Several MS have national regulations or rules for monitoring catch composition. The approved sampling plans from each MS around the Baltic and the results of a questionnaire analysis presented at the Expert Group on Fisheries Control in Riga, Latvia, 1-2 December 2014, were made available by the European Commission to STECF. These documents show a wide range of sampling methods.

STECF notes that the Commission Regulation (EEC) No 954/87 provides guidance for control authorities on several aspects for representative sampling of catches and landings. In particular, control inspectors are obliged to take samples from different parts of the catch on deck or at intervals during landing. Furthermore, the minimum sample weight to be applied is 100 kg or “one part in two thousand” of the landing or catch weight, “whichever is the greater”. However, there is no definition of the required sampling coverage in terms of geographical area of catch or port, seasonal coverage, or of frequency and distribution of sampling.

STECF notes that the issue of species misreporting in mixed pelagic fisheries in the Baltic Sea has been discussed in ICES for several years. In the Benchmark Workshop on Baltic Multispecies Assessments, WKBALT (ICES 2013), the analysis of questionnaires on the national methods for catch sampling and reporting showed that:

a) misreporting is mainly an issue of the industrial trawl fishery in nearshore waters; and
b) sprat and herring landings may be underestimated by 4-5%.

STECF conclusions
STECF was requested to assess whether the provisions of Regulation 954/87 will lead to statistically sound estimates of the catches of herring and sprat fisheries in the Baltic. In order

to do so, an overview of the currently used methods to sample catches and the properties of samples (i.e. sample sizes, sampling frequency, geographical and seasonal coverage etc.) and the associated data and the raising procedures would have to be available to STECF to analyse the current situation and to provide guidance for “best practice”. As these data were not available, STECF is not in a position to evaluate the sampling strategy of the different Baltic MS and establish whether they are able to provide robust estimates of the proportion of sprat and herring caught by the pelagic fleet.

STECF concludes that there is a need for better guidance for the control authorities of Baltic MS on how species composition is derived from unsorted catches of sprat and herring in the Baltic. In order to establish a standard method that leads to comparable, statistically sound estimates, the following would have to be addressed by the European Commission:

- Define the sample unit
- Minimum sampling requirements (e.g. sample size, frequency)
- Where to take the sample (different parts and levels of the hold, different commercial categories etc.)
- When to take the samples (e.g. considering seasonal differences in fishing intensity)
- Ensure sufficient geographical coverage of the landing sites
- Standard data templates for each MS to complete so that data handling and calculations are facilitated and error risk is minimised.

STECF considers that, rather than conducting work to see whether the mix of sampling methods that have been used can be used to give reliable catch estimates, it would be more useful to agree and implement standardised sampling methods and data submission practices for all Baltic MS.

6.15. Landing Obligation Opt-in consequences

Background

In the joint recommendations submitted by the Scheveningen Group and subsequent EU delegated acts, the phasing-in of application of the landing obligation of demersal fisheries in North Sea was based on the principle that those fisheries that could be best defined as "targeted fisheries" will be phasing in the landing obligation in 2016. By-catches of other species (of the nine designated species in Article 15) in the same fisheries will be included in the landing obligation in subsequent years.

The Commission is expected to propose adjustments of the TAC (TAC top-ups) on the basis of ICES/STECF estimates of (current) discarding volumes for the catches falling under the landing obligation in 2016 in those fisheries. The Commission is expected to present such TAC top-ups in its proposal for the fishing opportunities 2016. These TACs will then be allocated between the Member States according to relative stability.

The Scheveningen Group has asked the Commission to request STECF (or ICES) to evaluate the possibility of an advanced application of the landing obligation in ICES zones IV and IIIa to additional species not currently covered by the landing obligation, by individual Member States who so wish. The question arises if such an advanced implementation of the landing

obligation ("opting in") by some Member States only could be accompanied by additional quota top-ups granted to the Member State that opts in.

The Scheveningen Group has confirmed that such quota top-ups on a Member State basis should not lead to any increase of fishing mortality, and that the relative stability principle must be respected.

The Scheveningen Group suggests the following model:
In order to avoid any increase in fishing mortality, the option of opting-in shall only apply when a Member State's contribution to the discards of a certain species in a specific area (the discard rate at member state level) corresponds to or exceeds the country's share of relative stability. In this case the country's quota-uplift should correspond to its relative stability-share of the quota for that species in that area.

If a Member State (A), which has opted-in to apply the landing obligation for a certain additional species, makes quota swaps to a Member State (B), which have not utilized the opt-in possibility regarding the specific species, Member State A would only make use of the possibility to swap away the quantity of the "initial" quota and not the extra quota given to the country as quota up-lift.

Example – MS A opt-in

TAC (landing) = 1.000t
Average discard = 40% => Total top up = 40% * 1.000t = 400t
MS A relative stability (RS) share of TAC = 25% => Max share of top up = 25% * 400t = 100t

1) MS A has a discard rate of 60% = 150t => Then MS A top up = RS share = 100t
2) MS A has a discard rate of 40% = 100t => Then MS A top up = RS share = 100t
3) MS A has a discard rate of 20% = 50t => Opt-in does not apply.

Request to the STECF
STECF is requested to consider the potential outcomes of "opting-in" for each Member State, for catches of the following stocks: cod, whiting and plaice for ICES areas IV and IIIa.

STECF is requested to analyse the available data including discard data for these stocks on a MS basis, and should:

a) Evaluate the potential effects on overall fishing mortality of opting in, overall and for each Member State with quota for the abovementioned stocks in the aforementioned areas;

b) Set out any conditions that would need to be applied to prevent fishing mortality from increasing as a result of such arrangements; and

c) Quantify the resulting relative share in the TAC after the quota changes per Member State as a result of the application of the opting in of Member States.

STECF response
In this response STECF used the following sources of information:

- The STECF database compiled by the STECF Expert Working Group on the Evaluation of Fishing Effort Regimes in European Waters (STECF 15-12) which provided information on average discard rates by Member States (MS), stock and areas. Discard rates were calculated over the last two years (2013-2014) to be consistent with calculation carried out for ToR 6.5.

- ICES stock summary advice sheets which provided information on catch advice and recent stock-level estimates of discard rates as used by ICES.

- COUNCIL REGULATION (EU) 2015/104 on fishing opportunity for 2015 which was used to calculate the relative stability share by MS for each stock.

a) Evaluate the potential effects on overall fishing mortality of opting in, overall and for each Member State with quota for the abovementioned stocks in the aforementioned areas;

STECF provides the following example as an illustration of the potential consequences of a partial opt-in on total catches and overall fishing mortality.

Table 1 presents the level of TAC top-ups (ICES "unwanted" catch) for cod in area IV split by Member States on the basis of relative stability or the predicted "unwanted" catch calculated using the average discard rates at MS level. In the first case (relative stability TAC top-ups), the total catches advised by ICES are shared among MS on the basis of the relative stability while in the second case (Top-ups based on STECF discard ratio), the landings advised by ICES are first shared among MS on the basis of the relative stability and are then used in combination with discarding rates from the STECF database to calculate potential discards. Top-ups based on STECF discard ratio were then scaled so that they sum up to the predicted discard tonnage of the ICES catch advice.

As discarding rates are variable across MS and do not necessarily correspond to the discard rates implied by a catch quota share based on the relative stability, for some MS, the resulting allocated catches may not cover the "potential" catches while for other, they may exceed it. For instance, based on RS share, Denmark would get 888t in excess of what it would need to cover its potential discards while UK would lack 1,797t (Table 6.15-1, last column). It is important to note that this calculation is made on the assumption that the average discarding rate calculated over 2013-2014 is valid for 2016.

Table 6.15-1 North sea cod TAC top-ups by Member States based on two calculations: relative stability share of the total catch advised by ICES or discarding rate applied to a relative stability share of the landings.

Area/Country	RS share of Advised Landings (t)	RS share of Advised Catches (t)	Relative Stability top-ups	STECF discard ratio	Predicted catches in excess of landings using STECF discard	Predicted catches in excess of landings Scaled to ICES	Excess/Missing RS top-ups to match potential discards***

					ratio*	advice**	
(IV+VIId+IIIa)	40419	49259					
IV	33554	40892	7339				
Belgium	991	1208	217	0.26	253	216	1
Denmark	5697	6943	1246	0.07	420	358	888
Germany	3612	4402	790	0.06	231	197	593
France	1224	1492	268	0.22	266	226	41
Netherlands	3219	3923	704	0.16	512	436	268
Sweden	38	46	8	0.08	3	2	6
UK	13069	15927	2858	0.42	5461	4655	-1797
EU	27850	33941	6091		7146	6091	0
Norway	5704	6952					

*predicted catches in excess of advised landings estimated using historic STECF discard rates
**predicted catches in excess of advised landings scaled so that the unwanted catches by MS are consistent with the ICES total unwanted catch forecast.
***provides an estimate of whether catches are predicted to exceed or fall below the catch (landings + discards) distribution based on relative stability

Let's first assume that only Denmark applies for opting-in. On the principle that this country receives a top-up based on its relative stability share of the total advised catches, it could get a top-up of 1,246t on its RS share of the advised landings (Table 6.15-2, column 4). Taking account the catches (landings plus discards) of other MSs, the expected total catch would be 34,829t, which would be above the ICES advised catch of 33,941 t as, for this MS, the relative stability share of the top-up (1,246t) is higher than the predicted "unwanted" catch based on its recent discard rate (358t).

On the contrary, if now, we assume that only UK applies for opting-in (Table 6.15-3), this would result in a total catches of 32,144t, which is below the ICES advised catch of 33,941t. Note that the predicted unwanted catch for the UK is 4,655t, which is well above its potential TAC top-up based on relative stability share which is 2,858t (Table 6.15-1, column 4).

Therefore, an advanced implementation of the landing obligation could thus potentially, in some cases i.e. Danish example above, lead to an overshoot in advised catches (Table 6.15-2, column 5) and subsequently to an increase in overall fishing mortality. Therefore, in order to maintain overall catches within the ICES advised levels would require other MS to reduce their overall advised landings by 888t (1,246t -358t) to compensate. Conversely, advance implementation (opt-in) for the UK would lead to an undershoot in advised catches as their resulting catches would be 1,797t lower than implied if they continued discarding (17,724t – 15,927t).

Table 6.15-2 North Sea cod total catches and catches by member states as a result of partial "opting-in" from Denmark

Area/Country	Advised Landings (t)	Advised Catches (t)	Discard/top-up*	Resulting catches
(IV+VIId+IIIa)	40419	49259		
IV	33554	40892		
Belgium	991	1208	216	1207
Denmark	**5697**	**6943**	**1246**	**6943**
Germany	3612	4402	197	3809
France	1224	1492	226	1451
Netherlands	3219	3923	436	3655
Sweden	38	46	2	40
UK	13069	15927	4655	17724
EU	27850	33941	6979	34829

*For counties highlighted in bold (Denmark) this value corresponds to their relative stability share of predicted "unwanted" ICES catches, all other countries the values relate to their predicted discarded "unwanted" catch i.e. catches in excess of total allowable landings.

Table 6.15-3 North Sea cod total catches and catches by member states as a result of partial "opting-in" from UK

Area/Country	Advised Landings (t)	Advised Catches (t)	Discard/top-up*	Resulting catches
IV+VIId+IIIa	40419	49259		
IV	33554	40892		
Belgium	991	1208	216	1207
Denmark	5697	6943	358	6055
Germany	3612	4402	197	3809
France	1224	1492	226	1451
Netherlands	3219	3923	436	3655
Sweden	38	46	2	40
UK	**13069**	**15927**	**2858**	**15927**
EU	27850	33941	4294	32144

*For counties highlighted in bold (UK) this value corresponds to their relative stability share of predicted "unwanted" ICES catches, all other countries the values relate to their predicted discarded "unwanted" catch i.e. catches in excess of total allowable landings.

b) Set out any conditions that would need to be applied to prevent fishing mortality from increasing as a result of such arrangements;

In cases where opting-in could lead to potential overshoot of advised catches, some adjustment in the quota allocations of "non opting-in" MS or the top-ups allocated to "opting-in MS" would need to be made to ensure that the advised catches are not exceeded and that fishing mortality does not increase. In the example presented in Table 6.15-2, this would either require MS that do not opt-in reducing their landings by 888t (or reduce their unwanted catch by the same amount) or for the Danish TAC top-up to be limited to their predicted catch in excess of permitted landings to 358t and therefore not avail of the relative stability share of "unwanted" catches (1,246t). STECF acknowledges that the allocation of such adjustments between MS is a decision for managers. STECF notes that the principle of article 16.2 of

Regulation (EU) No 1380/2013 (TAC adjustments/Top-ups) is to fix fishing opportunities so they are reflective of catches rather than relative stability: "*fishing opportunities shall be fixed taking into account the change from fixing fishing opportunities that reflect landings to fixing fishing opportunities that reflect catches, on the basis of the fact that, for the first and subsequent years, discarding of that stock will no longer be allowed*."

c) Quantify the resulting relative share in the TAC after the quota changes per Member State as a result of the application of the opting in of Member States.

STECF considered the potential outcomes of applying the approach proposed by the Scheveningen Group to the stocks of cod, whiting and plaice for ICES areas IV and IIIa. Results of the analysis have been compiled in Tables Table 6.15-4 to Table 6.15-10.

Calculation of relative stability TAC top-ups and of top-ups based on STECF discard ratio have been carried out according to the approach described above. This allows to determine whether a Member State fulfils the conditions required to opt-in (i.e. in the proposed approach, "that the contribution to the discards of a certain species in a specific area (the discard rate at member state level) corresponds to or exceeds the country's share of relative stability"). For MS not fulfilling those conditions, the catches that correspond to what would have been potential discards is reported in the column labelled "Opt-in not possible: discards". Those MSs therefore are not eligible for any top-up and will continue to discard. For the MS fulfilling the opt-in condition, the column labelled "Opt-in possible: top-up" contains the top-up based on the relative stability rule.

For the Member States fulfilling the opt-in condition, the allocated quotas are calculated as the RS share of the catch. For the other MS, the allocated quotas are simply set equal to the RS share of the advised landings. The last two columns of Tables Table 6.15-4-Table 6.15-10, allow a comparison between the relative stability share of the quota and the share implied by the application of the approach proposed by the Scheveningen Group.

A compilation of the resulting total catches by area and stock when applying the opting-in approach is presented in Table 6.15-11 together with the catches advised by ICES..

As expected, for all stocks and areas, the approach proposed by the Scheveningen Group avoids an overshoot of the advised catch and as a consequence fishing mortality should not increase. However, this implies that the relative stability principle is not respected as is shown in the two last columns of Tables Table 6.15-4 to Table 6.15-10. In most cases however, the departures from the agreed RS shares are relatively small.

It must be stressed however that those results are on the condition that there is no change on the fishing pattern of the MS fleets.

STECF comments and conclusions

STECF concludes that the implementation of opt-in under the landing obligation could potentially lead to TAC overshoot and subsequently to an increase in fishing mortality if unwanted catch is distributed on the basis of relative stability. Avoiding such increase would require some adjustment in fishing opportunities which would be shared between MS or

fleets, with some MS taking larger reductions than others. STECF considers that this adjustment is a management decision.

STECF notes that the approach proposed by Scheveningen Group provides a safeguard against overshooting the TAC in cases where one or more Member States opt in to the landing obligation in ICES zones IV and IIIa for cod, whiting and plaice.

STECF notes that the Scheveningen approach would only allow those Member States that have high discard rates access to opt-in to the obligation to land all catches. . STECF also notes that this could lead some fleets/MS that would not be able to opt-in in 2016 to increase their discard rates in order to be able to opt-in in the following years, before the landing obligation is fully implemented for that stock/area. STECF considers that provisions are needed to prevent this.

STECF notes that fleets which opt-in, may change their fishing tactics to take advantage of the additional fishing opportunity by avoiding undersized fish and catch and land more marketable fish. While this may be beneficial to the stock and fishery in the long-term, such changes could lead to an increase in fishing mortality on larger/older fish in the short term.

On a more general point, STECF finally notes that the calculations made for this Term of Reference clearly shows that the allocation of catch quotas according to relative stability will lead to MSs fishing opportunities being out of line with their potential catches if their catch patterns remain constant. If the allocation of fishing opportunities is made on the basis of a relative stability share of advised landings and top-ups are based on MSs' average discard rates, then the total fishing opportunities will be in line with their potential catches but the principle of relative stability rule will be violated.

Table 6.15-4 Potential outcomes when applying the opting-in approach proposed by the Scheveningen Group. Cod in area IV

Area/Country	Advised Landings (t)	Advised Catches(t)	Relative Stability TAC top-ups	STECF discard ratio	Predicted catches in excess of landings using STECF discard ratio	Predicted catches in excess of landings Scaled to ICES advice	Opt-in not possible : discards	Opt-in possible : top-up	Quota allocated to MS	Share of quota if opt-in	Relative Stability
IV+VIId+IIIa	40419	49259									
IV	33554	40892	7339								
Belgium	991	1208	217	0.26	253	216	216	0	991	2.6	3.0
Denmark	5697	6943	1246	0.07	420	358	358	0	5697	15.1	17.0
Germany	3612	4402	790	0.06	231	197	197	0	3612	9.6	10.8
France	1224	1492	268	0.22	266	226	226	0	1224	3.3	3.6
Netherlands	3219	3923	704	0.16	512	436	436	0	3219	8.5	9.6
Sweden	38	46	8	0.08	3	2	2	0	38	0.1	0.1
UK	**13069**	**15927**	**2858**	**0.42**	**5461**	**4655**	**0**	**2858**	**15927**	**42.3**	**38.9**
EU	27850	33941	6091		7146	6091	1436	2858	30708	81.5	83.0
Norway	5704	6952							6952	18.5	17.0

Table 6.15-5 Potential outcomes when applying the opting-in approach proposed by the Scheveningen Group. Cod in area IIIa - Skagerrak

Area/Country	Landings (t)	Catches(t)	Relative Stability TAC top-ups	STECF discard ratio	Top-ups based on STECF discard ratio	Scaled to get ICES advice	Opt-in not possible : discards	Opt-in possible : top-up	Quota allocated to MS	Share of quota if opt-in	Relative Stability
IV+VIId+IIIa	40419	49259									
IIIa Skagerrak	4795	5843	1049								
Belgium	12	14	3	0.37	4	3	3	0	12	0.2	0.2
Denmark	3964	4831	867	0.26	1043	589	589	0	3964	80.1	82.7
Germany	100	122	22	0.21	21	12	12	0	100	2.0	2.1
Netherlands	25	30	5	0.26	6	4	4	0	25	0.5	0.5
Sweden	**694**	**846**	**152**	**1.12**	**781**	**441**	**0**	**152**	**846**	**17.1**	**14.5**
EU	4795	5843	1049		1855	1049	607	152	4947	100.0	100.0

Table 6.15-6 Potential outcomes when applying the opting-in approach proposed by the Scheveningen Group. Cod in area IIIa - Kattegat

Area/Country	Landings (t)	Catches(t)	Relative Stability TAC top-ups	STECF discard ratio	Top-ups based on STECF discard ratio	Scaled to get ICES advice	Opt-in not possible : discards	Opt-in possible : top-up	Quota allocated to MS	Share of quota if opt-in	Relative Stability
IIIa Kategat	139	536	397								
Denmark	86	332	246	3.35	289	189	189	0	86	60.3	62.0
Germany	**1**	**5**	**4**	**97.80**	**136**	**89**	**0**	**4**	**5**	**3.7**	**1.0**
Sweden	51	198	147	3.53	182	119	119	0	51	36.0	37.0
EU	139	536	397		606	397	308	4	143	100.0	100.0

Table 6.15-7 Potential outcomes when applying the opting-in approach proposed by the Scheveningen Group. Whiting in area IV

Area/Country	Landings (t)	Catches(t)	Relative Stability TAC top-ups	STECF discard ratio	Top-ups based on STECF discard ratio	Scaled to get ICES advice	Opt-in not possible : discards	Opt-in possible : top-up	Quota allocated to MS	Share of quota if opt-in	Relative Stability
IV+VIId	13957	25000									
IV	11626	20825	9199								
Belgium	**238**	**426**	**188**	**2.93**	**697**	**492**	**0**	**188**	**426**	**3.2**	**2.0**
Denmark	1028	1841	813	0.04	36	25	25	0	1028	7.6	8.8
Germany	267	478	211	0.71	191	134	134	0	267	2.0	2.3
France	**1544**	**2766**	**1222**	**4.50**	**6950**	**4899**	**0**	**1222**	**2766**	**20.5**	**13.3**
Netherlands	**594**	**1064**	**470**	**4.01**	**2384**	**1681**	**0**	**470**	**1064**	**7.9**	**5.1**
Sweden	2	3	1	0.24	0	0	0	0	2	0.0	0.0
UK	7428	13305	5877	0.30	2201	1551	1551	0	7428	55.0	63.9
EU	11101	19884	8783		12460	8783	1712	1880	12981	96.1	95.5
Norway	525	941							525	3.9	4.5

Table 6.15-8 Potential outcomes when applying the opting-in approach proposed by the Scheveningen Group. Whiting in area IIIa

Area/Country	Landings (t)	Catches(t)	Relative Stability TAC top-ups	STECF discard ratio	Top-ups based on STECF discard ratio	Scaled to get ICES advice	Opt-in not possible : discards	Opt-in possible : top-up	Quota allocated to MS	Share of quota if opt-in	Relative Stability
IIIa	135	500	365								
Denmark	**122**	**451**	**329**	**1.18**	**143**	**488**	**0**	**329**	**451**	**90.1**	**90.1**
Netherlands	**0**	**1**	**1**	**1.62**	**1**	**2**	**0**	**1**	**1**	**0.3**	**0.3**
Sweden	**13**	**48**	**35**	**5.42**	**70**	**240**	**0**	**35**	**48**	**9.6**	**9.6**
EU	135	500	730		214	730	0	365	500		

Table 6.15-9 Potential outcomes when applying the opting-in approach proposed by the Scheveningen Group. Plaice in area IV

Area/Country	Landings (t)	Catches(t)	Relative Stability TAC top-ups	STECF discard ratio	Top-ups based on STECF discard ratio	Scaled to get ICES advice	Opt-in not possible : discards	Opt-in possible : top-up	Quota allocated to MS	Share of quota if opt-in	Relative Stability
IV+IIIa	159197	213440									
IV	147633	197935	50303								
Belgium	8470	11356	2886	0.45	3774	2392	2392	0	8470	5.0	5.7
Denmark	27529	36909	9380	0.06	1695	1074	1074	0	27529	16.3	18.6
Germany	**7941**	**10646**	**2706**	**0.89**	**7044**	**4464**	**0**	**2706**	**10646**	**6.3**	**5.4**
France	**1588**	**2129**	**541**	**0.77**	**1225**	**777**	**0**	**541**	**2129**	**1.3**	**1.1**
Netherlands	**52940**	**70979**	**18038**	**0.92**	**48945**	**31018**	**0**	**18038**	**70979**	**42.0**	**35.9**
UK	39176	52524	13348	0.29	11321	7174	7174	0	39176	23.2	26.5
EU	137644	184543	46899		74005	46899	10641	21285	158929	94.1	93.2
Norway	9989	13392	3404		0.63				9989	5.9	6.8

Table 6.15-10 Potential outcomes when applying the opting-in approach proposed by the Scheveningen Group. Plaice in area IV

Area/Country	Landings (t)	Catches(t)	Relative Stability TAC top-ups	STECF discard ratio	Top-ups based on STECF discard ratio	Scaled to get ICES advice	Opt-in not possible : discards	Opt-in possible : top-up	Quota allocated to MS	Share of quota if opt-in	Relative Stability
IV+IIIa	159197	213440									
IIIa	11564	15505	3940								
Belgium	70	94	24	0.12	8	22	22	0	70	0.6	0.6
Denmark	9188	12319	3131	0.10	932	2456	2456	0	9188	78.3	79.5
Germany	47	63	16	0.12	6	15	15	0	47	0.4	0.4
Netherlands	1767	2369	602	0.04	73	193	193	0	1767	15.1	15.3
Sweden	**492**	**659**	**168**	**0.97**	**476**	**1254**	**0**	**168**	**659**	**5.6**	**4.3**
EU	11564	15505	3940		1496	3940	2686	168	11732		

Table 6.15-11 Total catches based on the ICES advice and resulting from the implementation of the "opt-in" according to the approach proposed by the Scheveningen Group

Species	Area	Based on ICES advice	Opt-in
Cod	IV	33941	32144
Cod	IIIa Skagerak	5843	5554
Cod	IIIa Kattegat	536	451
Whiting	IV	19884	14693
Whiting	IIIa	500	500
Plaice	IV	184543	169569
Plaice	IIIa	15505	14418

7. STECF RECOMMENDATIONS FROM STECF-PLEN-15-03

No new recommendations arose during discussions at the 50th plenary meeting of the STECF.

8. BACKGROUND DOCUMENTS

Background documents in including the declarations of invited and JRC experts (see also section 9 of this report – List of participants) are published on the meeting's web site on: https://stecf.jrc.ec.europa.eu/plen1503

9. 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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