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SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES – 56TH PLENARY MEETING REPORT (PLEN-17-03)

PLENARY MEETING,

06-10 November 2017, Brussels

Edited by Clara Ulrich & Hendrik Doerner

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Abstract

Commission Decision of 25 February 2016 setting up a Scientific, Technical and Economic Committee for Fisheries, C(2016) 1084, OJ C 74, 26.2.2016, p. 4–10. The Commission may consult the group on any matter relating to marine and fisheries biology, fishing gear technology, fisheries economics, fisheries governance, ecosystem effects of fisheries, aquaculture or similar disciplines. The Scientific, Technical and Economic Committee for Fisheries hold its 56th plenary on 6-10 November 2017 in Brussels.

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56th PLENARY MEETING REPORT OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (PLEN-17-02)

PLENARY MEETING

10-14 July 2017, Brussels

1. INTRODUCTION

The STECF plenary took place at the Centre Borschette, Brussels, from 6 to 10 November 2017. The chair of the STECF, Clara Ulrich, opened the plenary session at 11:00h. The terms of reference for the meeting were reviewed and discussed 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 10 November 2017.

2. LIST OF PARTICIPANTS

The meeting was attended by 29 members of the STECF, two invited experts and four JRC personnel. 14 DG MARE, one DG ENV, and one DG RTD attended parts of the meeting. Section nine of this report provides a detailed participant list with contact details.

The following STCF members were unable to attend the meeting:

1. Haritz Arrizabalaga
2. Hilario Murua
3. Antonello Sala

3. INFORMATION TO THE PLENARY

The STECF was informed on the current state of planning for meetings and requests for advice by written procedures in the 4th quarter 2017 and 2018.

Meetings 2017:

- EWG 17-13: Evaluation of DCF National work plans amendments for 2018/19: 13-17 November, Hamburg, Germany, chair: C. Stransky
- EWG 17-15: Stock assessments in the Mediterranean Sea 2017- Part II, 27 November – 3 December, Rome, chair: J. Simmonds

Meetings 2018:

- EWG 17-16: Economic report fish processing: 15-19 January, JRC-Ispra, chair: R. Döring (https://stecf.jrc.ec.europa.eu/ewg1716)
- PLEN-18-01: 2018 spring plenary meeting, 2018, 9-13 April 2018, venue tbd, chair: Ulrich
- EWG 17-14: Evaluation and updating the list of mandatory surveys: 14-18 May 2018, JRC/Ispra/Varese, chair: D. B. Sampson

Forthcoming written procedures:

1. Review of work of EWG 17-13: Evaluation of DCF National work plans amendments for 2018/19 – deadline for OWP 8 December 2017

4. ASSESSMENT OF STECF EWG REPORTS

4.1 EWG 17-08 Balance/Capacity

Request to the STECF

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

STECF Response

STECF reviewed the report of EWG 17-08 and notes that the terms of reference were addressed to the extent possible during the meeting. Inferences regarding the assessment of balance between fishing capacity and fishing opportunities presented in the report are in accordance with the specifications for interpretation of indicator values given in the 2014 guidelines (COM (2014) 545 Final).

STECF notes that the definition of the SAR indicator makes it unsuitable for assessing trends, as concluded in STECF 15-02 and 15-15 reports.

STECF notes that determination of balance between fishing opportunity and fleet capacity is partly based on preferences and value judgements relating to social matters and has no directly observable objective unit of measurement. STECF has detailed several concerns in previous reports [STECF-15-02, starting at p.9, STECF-15-15, starting at p.9], and reiterates that balance indicators should only be used to highlight fleet segments which might have been out of balance with their fishing opportunities, and which might warrant further consideration and investigation to determine whether there is a problem with balance that might require an action plan. The indicator values (individually or in combination) cannot be considered reliable metrics to identify which fleet segments require an action plan.

STECF considers that the current methodology, used since 2014 including in the present EWG 17-08 report is of limited use in assessing the balance between fleet capacity and fishing opportunity and are not sufficient to determine the need for an action plan to address any imbalance indicated.

STECF conclusions

STECF concludes that the guidelines on balance indicators (COM (2014) 545 Final) should be revised in line with previous advice, taking into account concerns and proposals in previous EWG reports [STECF-15-02, STECF-15-15] and Annex 1 of the report by EWG 16-09. This revision would enable scientific expertise to be better employed to assist the Commission and Member States in meeting their obligations under Article 22 of the CFP (Regulation (EU) No 1380/2013).

References

Scientific, Technical and Economic Committee for Fisheries (STECF) – Assessment of balance indicators for key fleet segments and review of national reports on Member

States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-15-02). 2015. Publications Office of the European Union, Luxembourg, EUR 27134 EN, JRC 94933, 147 pp.

Scientific, Technical and Economic Committee for Fisheries (STECF) – Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-15-15). 2015. Publications Office of the European Union, Luxembourg, EUR 27555 EN, JRC 97991, 160 pp.

4.2 EWG 17-09 Stock assessments in the Mediterranean Sea - part I

Request to the STECF

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

STECF observations

The Expert Working Group was held in Split, Croatia, from 23rd to 29th September 2017. The meeting was attended by 19 experts in total, including 2 STECF members, 2 JRC experts and 1 expert from a non- EU country.

The objective of the EWG 17-09 was to carry out small pelagic stock assessments defined in the ToRs. In line with the previous Mediterranean assessment meeting (STECF-16-17) EWG17-09 had two additional days to answer the ToRs. STECF notes that this additional time was of considerable help, allowing a completion of the assessments and a full review of the work and agreement on conclusions during the meeting.

STECF comments

STECF considers that the EWG successfully addressed all the ToRs. STECF notes that the EWG carefully reviewed the quality of the assessments produced. Some analyses were considered to be suitable for short term forecasts, others were only considered sufficiently reliable to estimate F-status, but no forecast was produced; and one assessment was judged to be too unreliable to determining stock status or to provide advice.

A total of 13 area/species combinations were evaluated (Tables 4.2.1 and 2). STECF highlights below the main outcomes by stock. Statements about changes in catches or landings refer to 2018 compared with 2016 following the short-term forecast (Table 4.2.2):

- **Anchovy GSA 6** – Fishing mortality is fluctuating at about 1.2 times F_{MSY} and landings should decrease by 14%.
- **Anchovy GSA 7** – Fishing mortality is unknown. Biomass is fluctuating but increasing slowly. Landing should decrease by 7%.
- **Sardine GSA 6** – Fishing mortality has been increasing over the last ten years and it is about 2.5 times F_{MSY}. Landings should decrease by 49%.
- **Sardine GSA 7** - Fishing mortality is unknown. Biomass is relatively stable. Landings should decrease by 46%.
- **Atlantic horse mackerel GSA 1-5-6-7** - Fishing mortality is unknown. Biomass is relatively stable. Landings should decrease by 4%.
- **Anchovy GSA 9-10-11** – Fishing mortality is decreasing, but it is still at 1.5 times F_{MSY}. Catches should decrease by 19%.
- **Sardine GSA 9-10-11** - Fishing mortality is unknown. Biomass is increasing. Landings could increase by 27%.
- **Atlantic Horse mackerel GSA 9-10-11** - Fishing mortality is decreasing, but it is still at 2.5 times F_{MSY}. Catches should decrease by 69%.

- **Anchovy GSA 17-18** – Fishing mortality is increasing and it is 2.3 times F_{MSY}. Catches should decrease by 63%.
- **Sardine GSA 17-18** - Fishing mortality has been increasing over a long period, but it is estimated to have declined in the last two years and is now around 3 times F_{MSY}. Catches should decrease by 61%.
- **Atlantic horse mackerel GSA 17-18-19-20** – Due to data deficiencies no advice can be provided.
- **Anchovy GSA 22** – Stock status is poorly estimated due to lack of data in some years. Fishing mortality is estimated to be close to F_{MSY}. Catch advice is not provided.
- **Sardine GSA 22** – Stock status is poorly estimated due to lack of data in some years. Fishing mortality is estimated to be close to F_{MSY}. Catch advice is not provided.

STECF also points out that additional considerations about biomass reference points B_{lim}, B_{pa} and MSY $B_{trigger}$ for anchovy and sardine in GSA 17-18 are provided in the section 5.7 of this plenary report.

Summary sheets by stock are provided in the EWG report (section 5). The report summarises the available data for each area/species combination; assessment or index analyses and catch options whenever suitable. Where possible, stock status and catch estimates are provided, as well as a short term forecast in terms of changes in F.

The EWG has carried out five age-based analytical assessments with short term forecasts, using a proxy for F_{MSY} target (based on exploitation rate E=F/Z=0.4) and catch advice for 2018 (Sardine in GSA 6, and GSAs 17-18; Anchovy in GSAs 9,10 & 11 and GSAs 17-18 and horse mackerel in GSAs 9-10&11). A full analytic assessment with MSY based catch advice was obtained for another stock using surplus production method (Anchovy in GSA 6). Overall STECF considers these six assessments are suitable for evaluation of stock status and catch advice.

STECF notes that for four stocks (Anchovy in GSA7, Sardine in GSA 7; horse mackerel in GSAs 1, 5, 6 & 7; Sardine in GSA 9 & 10) the data was considered insufficient to run an analytical assessment, but a suitable biomass index was identified for each of these stocks and precautionary catch advice is provided. A precautionary buffer (an additional 20% reduction in catches in 2018) was advised when the length indicator showed the stock was being exploited above MSY. Only in the case of Sardine in GSA 9&10 did the length analysis indicate the exploitation was below MSY.

STECF notes though that there are still a lot of challenges linked with the use of length-based indicators to estimate stock status, as explored in STECF EWG 17-07, and further developments are still required. STECF also notes that for three stocks in this category the disparity between reported catch from biological (MED & Black sea data call) and economic (annual economic report) databases, particularly from France, is contributing to the uncertainty of stock status for these stocks. The reasons for these discrepancies would need to be addressed

STECF notes that for all the stocks in GSAs 6, 7 9, 10 and 11, the time series of data are short; the quality of the assessments was evaluated based on retrospective patterns and the assessment of three stocks were accepted as sufficiently consistent for catch advice. STECF endorses these assessments. STECF also agrees with the use of E=0.4 as a F_{MSY} proxy for these stocks.

STECF notes that for both sardine and anchovy in GSAs 17 and 18, some reservations were made regarding the older landings data (pre 2000). To address this issue both long time series and truncated time series assessments were evaluated and for both stocks

the stock status in 2016 and catch advice for 2018 was unchanged by the truncation of the data. The models including the older data showed some improvements in model stability, and the EWG considered that while some of the detail in earlier years might be uncertain the general stock trajectories were important and acceptable and reflected real difference in stock size. Truncation can give a different perception of history, an in line with previous STECF and GFCM assessments the STECF therefore endorsed these options in preference to the truncated data. STECF also notes that there is some uncertainty in aging of anchovy in GSA 17-18, particularly for the surveys. STECF recommends that future work is carried out to adopt a common otolith reading protocol and carry out an intercalibration of age reading. However, STECF considers that the sensitivity tests were carried out and the assessment for anchovy in GSAs 17-18 was found to be robust to the survey aging, and is therefore acceptable for advice.

The initial assessment for anchovy GSA 9, 10 &11 was performed using the full time series of data, but this resulted in a high biomass in the early years, and with no survey data available to confirm these high levels. An assessment using a truncated time series gave very similar results for subsequent years and acceptable retrospective performance. Therefore, the final model was based on truncated data series.

STECF notes that the EWG provides estimates for MSY ranges (Table 4.2.3) that are required for Multi-annual management plans, based on regressions calculated on other stocks (mainly from North-East Atlantic waters) for which these ranges have been estimated. STECF considers that full evaluation of MSY ranges requires defining Stock-Recruit relationships or at least biomass limit reference points and recruitment dynamics over the full range of biomass. STECF considers this is not possible for most stocks dealt with in the EWG report due the short time series of data.

STECF considers that E=0.4 provided an effective proxy for F_{MSY} and thus that F_{MSY} and F_{lower} are both implicitly precautionary and can be considered valid MSY estimates that can be used for multi-annual plans directly. STECF recommends that the values of F_{upper} resulting from the calculations should not be used for management purposes. F_{upper} should be limited to F_{MSY} (see table 4.2.3). STECF notes that for most small pelagic stocks assessed in the ICES area, F_{upper} has not been found to be precautionary (ICES, 2015) and for such stocks F_{upper} is equal to $F_{MSY.}$

Table 4.2.1. Summary of work was attempted and basis for any advice. A4A, XSA, and SAM are age based assessment methods; SPiCT is a surplus production model. STF is a standard short term projection with assumptions of status quo F in the intermediate year (2017) and recent historic recruitment for 2017 and 2018.

Area	Species	Previous Analysis / year	Attempted analyses and basis of advice (in bold)
GSA 5-6-7	Anchovy GSA 6	ASPIC with biomass index, /2016	Length indicator, **SPiCT, STF**
	Anchovy GSA 7	ASPIC, XSA /2016	Length indicator, **Biomass Index**
GSA 5-6-7	Sardine GSA6	XSA	Length indicator, **XSA, STF**
	Sardine GSA7	biomass index /2016	Length indicator, SPiCT, **Biomass index**
GSA 1-5-6-7	Atlantic horse mackerel	No assessment /2016	Length indicator, **Biomass index**
GSA 9-10-11	Anchovy	XSA (GSA 9) 2016	Length indicator, **XSA, STF**
GSA 9-10-11	Sardine	SepVPA (GSA 9) 2013	Length indicator, XSA, **Biomass index**
GSA 9-10-11	Atlantic horse mackerel	Biomass Index 2016	Length indicator, **XSA, STF**
GSA 17-18	Anchovy	SAM /2016	Length indicator, **SAM, STF**
GSA 17-18	Sardine	SAM/2016	Length indicator, **SAM, STF**
GSA 17-18-19-20	Atlantic horse mackerel	No assessment	No Assessment or advice
GSA 22-23	Anchovy	ICA, XSA /2012	Length indicator, SPiCT, SAM, **a4a**
GSA 22-23	Sardine	ICA, XSA /2012	Length indicator, SPiCT, SAM, **a4a**

Table 4.2.2. Summary of advice from EWG 16-17 by area and species. F 2016 is terminal F in the assessment. Anchovy and sardine in GSA 22 indicate observed catch from the assessment. Change in F is the difference as % change between target F in 2018 and the estimated F for 2016. Change in catch is % change from catch 2016 to catch 2018. Biomass status is given relative to B_{MSY} where available, (only Anchovy GSA 6) and as an indication of trend over the last 3 years for stocks with time series analytical assessments, biomass indices. (^{L} indicated landing only, not catch).

Species	**Area**	**Method/ basis**	**F 2016**	**F 2018**	**Change in F**	**Catch 2016**	**Catch 2018**	**Change in catch**	**Biomass (status)**
Anchovy	GSA 6	SPICT STF F_{MSY}	0.83	0.7	-16%	17830 ^{L}	15387 ^{L}	-14%	82%B_{MSY}
	GSA 7	Biomass Index				1257 ^{L}	1343 ^{L}	+7%	Stable
Sardine	GSA 6	XSA STF E 0.4	1.35	0.53	-61%	1257 ^{L}	1343 ^{L}	-49%	Stable
	GSA 7	Biomass Index				846 ^{L}	453 ^{L}	-46%	Stable
Atlantic horse mackerel	GSA 1-5-6-7	Biomass Index					No Advice	-4%	Increasing
Anchovy	GSA 9-10-11	XSA STF E 0.4	0.41	0.26	-37%	8931^{L}	7222^{L}	-19%	Increasing
Sardine	GSA 9-10-11	Biomass Index				2018	2556	27%	Increasing
Atlantic horse mackerel	GSA 9-10-11	XSA STF E 0.4	0.56	0.23	-59%	3769	1183	-69%	Stable
Anchovy	GSA 17-18	SAM STF E 0.4	1.42	0.57	-58%	33113	12195	-63%	Decreasing
Sardine	GSA 17-18	SAM STF E 0.4	1.30	0.44	-66%	79405	30679	-61%	Decreasing
Atlantic horse mackerel	GSA 17-18-19-20	No assessment							
Anchovy	GSA 22	a4a	0.46	0.47	2%	10610			Increasing
Sardine	GSA 22	a4a	0.50	0.50	-6%	9655			Stable

Table 4.2.3. F_{MSY} ranges (F_{low} and F_{upp}) for small pelagic stocks from the Mediterranean. F_{upper} as estimated by EWG 17-09 has been replaced with the value of F_{MSY} because STECF considered that the values of F_{upper} given in the EWG report are not precautionary and should be not used. STECF notes these reference points might need to be re-evaluated in a MSE framework before being used in a multi-annual plans.

GSA	Species	Ref year	F_{MSY}	F_{upper}	F_{low}
GSA 6	Anchovy	2016	0.70	0.70	0.47
GSA 7	Anchovy	2016			
GSA 6	Sardine	2016	0.53	0.53	0.35
GSA 7	Sardine				
GSA 1-5-6-7	Atlantic horse mackerel				
GSA 9-10-11	Anchovy	2016	0.26	0.26	0.18
GSA 9-10-11	Sardine				
GSA 9-10-11	Atlantic horse mackerel	2016	0.23	0.23	0.16
GSA 17-18	Anchovy	2016	0.59	0.59	0.39
GSA 17-18	Sardine	2016	0.44	0.44	0.29
GSA 17-18-19-20	Atlantic horse mackerel				
GSA 22	Anchovy	2016	0.47	0.47	0.31
GSA 22	Sardine	2016	0.50	0.50	0.34

STECF conclusions

STECF acknowledges the EWG was able to address all the terms of reference, completing evaluations by GSA aggregations requested when possible. When available information did not allow the assessment by aggregated GSAs, the assessments were done by GSA separately.

Different assessment methodologies were used depending on data availability and quality. STECF notes that the available data did not allow the EWG to assess Atlantic horse mackerel in GSA 17-18-19-20.

STECF endorses the assessments and general recommendations derived from the EWG.

The STECF notes that the EWG stressed an urgent need to re-evaluate age assignment for the assessment for anchovy in GSA 17-18. STECF agrees with this recommendation aimed adopting a common age reading protocol.

STECF recognises the improvement of the coordination and harmonization among the scientific bodies of FAO-GFCM and EU in the preparation of EWG 17-09, in line with STECF PLEN 16-01 and 16-03 recommendations.

Regarding ToR 10 (providing detailed maps juveniles and spawning aggregations areas at NUTS 2 level), STECF notes that there is no marine equivalent to NUTS 2 on the land. To provide such maps, georeferenced data on the presence of juveniles and spawning adults would be required and these data were not available to the EWG. Only MEDISEH report was available to the EWG, and maps from this report are included in EWG 17-09 report.

4.3 EWG 17-10 Long term management of skates and rays

Request to the STECF

STECF is requested to review the report of the STECF Expert Working Group meeting and the additional information received from the Regional Groups after the EWG, evaluate the findings and make any appropriate comments and recommendations.

STECF response

Background for the STECF 17-10

Skates and rays are currently managed under five regional TACs. Each is a general skate and ray TAC including several species. ICES (International Council for the Exploration of the Sea) used to publish generic skates and rays stock assessment scientific advice but increasing scientific knowledge and data reporting at species level has allowed for the provision of advice at a more detailed level. As a result, TACs in each region include individual stocks which may have very different stock development and status and different advice and as STECF has previously noted, "the approach of setting combine TACs (…) does not offer adequate protection for ray species that require reductions in F" (STECF, 2014).

In recent years, a number of requests for scientific advice have been issued by the EU regarding the management of European skate and ray stocks. This includes a request to ICES in 2013 to explore alternative management measures, to list the associated data needs and explore the state of knowledge on the fishing activity (ICES, 2013); a request to STECF in 2015 on a proposal for an alternative TAC calculation method proposed by France (STECF, 2015); and a request to ICES in 2016 to review proposal of an in-year TAC adjustment in division 7d (ICES, 2016). In 2016, the Commission proposed a change to skate and ray TAC management for 2017, with several new sub-TACs for different species. The proposal used the existing "SRX" quota allocation key, applying the relative stability shares to each sub-TAC. Feedback from stakeholders and Member States raised concerns that such an allocation did not reflect current fishing activity and the distribution of species within the management area, causing significant socio-economic impact on fishermen. Thus at the December Fisheries Council, the proposal reverted back to the 2016 system of combined skate and ray quota management, but with a joint statement from Member States and the Commission to further explore alternative management options.

In March 2017, the Commission received advice from the North-Western Waters Advisory Council (NWWAC) suggesting several alternative management measures and requested they be reviewed by STECF. The Commission organised a seminar with fishermen, scientists, national administrations and other stakeholders in May 2017. This meeting helped in the drafting of these terms of reference for EWG 17-10.

STECF observations

The working group was held in Brussels, Belgium, 16-20 October 2017. The meeting was attended by 10 experts in total, including 2 STECF members and 1 JRC expert.

Terms of Reference for EWG-17-10

To review possible management options and recommend a new approach for the sustainable management of skates and rays fisheries.

The review and assessment of management options should consider; sustainability such as MSY proxies, the regional approach to fisheries management, mixed fisheries approach to catches of skates and rays and possible "choke" species, socioeconomic impacts and the practical applicability of management measures. Practical applicability would include the consideration of relative stability, including the evaluation of historic landing data, ease of enforcement / control and the risk to increased misreporting.

The Commission understands that many of the skate stocks concerned are data-limited and does not expect definitive quantitative simulations. A risk-based approach may be more suitable; however suggestions and analysis by STECF should include information on how skates and rays can be fished and managed sustainably in accordance with the CFP objectives in each scenario, with suggestions on appropriate safeguards and monitoring techniques.

Furthermore, the expert working group is requested to:

a) Collect and analyse information available for those fleets/métiers involved in the catch of skates and rays, by identifying (i) those métiers (or higher aggregation levels) catching skates, (ii) the catch composition (species and length composition) of the métiers, and (iii) the social and economic dependence of the métier on the main skate and rays species. Provide an overview of the current scientific knowledge and data availability regarding mixed-fisheries involved in the catch of skates and rays

b) Evaluate the usefulness of closed areas/seasons as measures for controlling fishing mortality and/or protecting spawning fish and reducing mortality on juveniles (survey data, scientific knowledge available in the literature).

c) Collate and review the results of research on selectivity and relevant bycatch mitigation measures for relevant fishing gears (haul time etc.) that would either help avoid the catch of skates and rays, or that could increase their discard survival. Evaluate the effect of the most relevant technical measures affecting the selectivity of fishing gears.

d) Collate and review information on the survival rates of skates and rays (updating STECF 2014). The output would be a table of stocks / species versus métier /fleet segment for each sea basin or TAC unit. This exercise should consider to what extent information from one métier / fleet could be extrapolated to other fleets, detailing the criteria to do so. If this is not possible, then the working group is requested to conduct a gap analysis, detailing what information would be required to consider extrapolation and high survivability exemptions across all species of skates and rays, métiers and fleer segments per sea basin or TAC unit, whichever is more suitable.

e) Compare the relative merits (Pros and cons) of potential alternative management measures proposed in the attached documentation by the NWWAC and the Dutch Elasmobranch Society, as well as the output of the 12 May Focus Group. These potential management measures can be considered in a qualitative, risk-based framework for each sea basin or TAC unit, based on expert opinion. DG MARE understands that no one measure will be perfect, so where possible, combinations of management measures that mitigate risks, should be suggested by the working group.

STECF observes that the ToRs were very ambitious and broad ranging. The EWG made substantial progress towards delivering all ToRs but was not able to recommend a new

approach for the sustainable management of skates and rays fisheries. The approach followed by the EWG 17-10 was to group the ToRs as follows:

The first category, including ToR a, c and d, is presented as a compilation and review of available information related to i) the fleets and métiers involved in the capture of skates and rays, ii) the results of research on selectivity and bycatch mitigation measures and iii) the survival rates following discarding.

ToR a *Skate catch data*

The EWG presented tables indicating the occurrence by ICES Division of 32 species of skates (Rajiformes) in the North-east Atlantic and those that are, or have been, exploited commercially in northern European fisheries (16 species). Information on the interactions of different gears with skate species are summarised and the differences in these interactions between inshore, coastal and off-shore fleets described, as well as specific skate fisheries by ICES area (ToR a.i). Data on the composition of skates caught in different fisheries and length frequencies in the full catch are presented but only for a few examples (ToR a.ii). STECF observes that the social and economic dependence of the métier on the main skate species could not be addressed (ToR a.iii).

STECF observes there is no single dataset that can provide all relevant skate fisheries data; there are various subsets of relevant data available, however the data sources used by EWG 17-10 are not clearly described. The EWG also noted that the ICES Working Group on Elasmobranch Fishes (WGEF) considers that some 'species-specific' records held in official data are inaccurate, which can be due to a range of issues (e.g. coding errors, misidentifications, misreporting). STECF observes that there is consensus that data limitations exist for skate stocks, but the nature of these limitations and the stocks to which they apply have not yet been defined. For example, there are discard data available in the STECF FDI database that is not referred to in the ICES advice.

ToR d) *Skate discard survival*

EWG-17-10 collated and reviewed available information on the discard survival rates of skates. As requested, the EWG updated a table from STECF (2015) and presented seven studies in European waters, of which only two estimated discard survival. The other studies reported either vitality values or the percentage of individuals that survived after the observation period.

STECF observes that, while it was useful to update the survival study table, modifying the table to include an assessment of the quality of the estimates would improve its utility. The table includes a column 'short-term'. STECF observes that the phrases of 'short-term' and 'long-term' discard survival estimates can be misleading, consequently the outputs of the ICES Workshop on Methods to Estimate Discard Survival (WKMEDS) no longer use these terms. There are two methods to estimate discard survival, i) deploying tags on discarded fish and retrieving those tags to determine the fate of the fish; and ii) taking fish at the point they would be discarded, holding them in captivity and recording their fate. When using this captive observation method, it is necessary that all mortalities associated with the commercial catch and sorting process are observed. This means that the monitoring period has to be sufficiently long to demonstrate that mortalities have stopped. If the monitoring period is too short, then the discard survival rates overestimate the true levels. But when applied correctly, both methods generate robust discard survival estimates, and the main difference between the two methods is that when using tags, the discard estimate includes the effect of predation, which is missing when using captive observation.

Therefore, some of the 'short-term' estimates presented may be robust discard survival rates that do not include predation, while other estimates may be generated from insufficient monitoring periods, but this cannot be determined from the table. Similarly, the EWG reports that none of the studies provide long-term discard survival estimates, however, STECF observes that one study using DST tags deployed on thornback rays (*Raja clavata*) was based on data collected for up to 317 days (Catchpole, 2017). Instead of short and long term estimates, the table could be modified in the future to include the experimental method used and the quality of the study. A critical review process developed by WKMEDS and used by STECF in assessing discard survival evidence has previously been applied to the reported studies (Catchpole, 2017), and this includes assessing whether all mortalities were observed when using the captive observation method.

Discard survival estimates are needed to support requests for exemption from the landing obligation. STECF observes that current estimates cover a limited number of métiers, areas and species, and because the factors that influence survival are poorly understood extrapolation across species, fisheries and areas is challenging. The EWG also recognised that it is important to further encourage good practice on fish handling when discarded alive.

ToR c) *Selectivity*

The EWG reports that gear-based technical measures for towed gears such as increased codend mesh sizes and square mesh panels are ineffective in increasing size selectivity for skates and rays because their large, flattened body shape prevents escape once inside fishing gears (Ellis et al., 2016). However, this type of modification can improve the condition of skates and therefore their survival chances, by reducing the volume of catch in the codend (e.g. Enever et al., 2010).

STECF observes that improvements in the selectivity of trawls for skates can be achieved through modifications which utilise the difference in shape and size of skates and behaviour compared with other species in the catch. The EWG divided these into sorting grids and By-catch Reduction Devices (BRDs), escape panels and separator trawls, and other trawl gear modifications. The short review provided by the EWG demonstrated good potential for these modifications to reduce catches of skates and rays.

The EWG reports that for static gears and long line fisheries, the options for reducing skate bycatch are limited, but there have been few studies to date. A number of possible modifications were given, including restricted lengths of net, limiting soak times, adjusting mesh size, hanging ratio and height of the net and modifying the thickness and colour of netting material for static nets and hook design for long lines.

STECF observes that reducing skate catches is often not a specific objective of gear trials, and observations of incidental catches of skates are not always recorded, and therefore information on the effect on skate of modified gears maybe more difficult to find. Under a Landing Obligation choke species scenario, where the quota for skates and rays is limited, there is likely to be an increase in interest in gear modifications that reduce skate catches.

ToRs b and e) *Management Measures*

The second group of ToRs, including ToR (b) and (e), is presented as a comparison of the relative merits of potential alternative management measures. The EWG notes that because no analytical stock assessments are available, there is no means for a quantitative evaluation of management measures. It was decided to draw up a list of the

pros and cons of a set of potential management measures and compare them using selected criteria.

TAC options

STECF observes that four methods of TAC setting were considered: general skate and rays TACs by region (status quo), general TACs with sub-TACs for particular stocks, TACs by genus and stock based TACs. The EWG note that ICES produces advice that allows the setting of landing TACs at stock level, but to set TACs on a catch basis, it will be necessary to get better estimates of dead discards. Related to this, the misidentification at species level and uses of generic categories in the reporting of landings and discard data also needs to be addressed. STECF observes that it would be useful to determine the level of confidence in the landing and discard data for the different stocks.

The EWG noted that the control of fishing mortality by stock will be higher in the case of TACs set at stock level and lower in the case of TACs combining all species. The current general skate and ray TACs may not offer adequate protection for stocks that require reductions in F and conversely, may limit catch opportunities for stocks in good condition. The EWG also report that incentives to misreport are likely to be lower for general TACs since the possibility of a TAC to become limited increases with the number of TACs – this has particular relevance in the context of the LO. However, while this true, STECF observes that the argument against splitting a TAC for a group of skate species to reduce the likelihood of reaching a choke point is essentially the same as that for grouping similar species to reduce the risk of choke, so this argument must be carefully considered.

Landing trip limits

This management measure would limit the quantities landed of selected species on a trip by trip basis. STECF observe that this measure was considered outside a quota limit system, but recognise that total removals would need to be managed to control fishing mortality. The main observation was that the utility of the approach was dependent on the species demonstrating good survival on release when the landing threshold is exceeded, and this evidence is currently limited.

Spatio-temporal measures

The EWG reports that spatio-temporal measures are useful only where they demonstrably control fishing mortality. These can be used to reduce mortality on stocks on a case-by-case basis and may be complemented by other generalised management measures. STECF observes that the tables presented listing species by ICES area could be used to build an evidence map which could then be used to demonstrate where data are sufficient to assess different management options. The EWG reports that the areas likely to be affected by spatio-temporal measures are potentially quite large with associated effects on wider fisheries. STECF observes that, in terms of species identification, the spatial distribution of commercial catches of different species could be validated using survey data.

Effort management

The EWG conclude that effort management may have fewer control and enforcement issues compared with other options. However, measuring (and limiting) increase in fishing efficiency is extremely difficult, which would undermine this approach. Moreover,

it would difficult to reconcile effort management for skates caught in combination with other species managed with quotas.

Size restrictions

Size restrictions of landings (minimum and/or maximum) would need to be specific to each species. The EWG noted that this measure would be in contradiction with the landing obligation if implemented in association with catch limits, unless exemptions on the basis of high survival are in place.

Prohibited species

The EWG states that the prohibited species list should be used for species which are biologically sensitive to any exploitation. STECF observe also that "Prohibited species" by their nature are sensitive species, mostly CITES listed, where even limited fishing activity could result in a serious risk to their conservation. There is currently no procedure on which to base decisions to include or exclude species from the prohibited list in the TACs and quota regulations. Moreover, the benefits of classifying species as prohibited are unknown without more information of the discard survival of incidental catches, and do not necessarily lead to a decrease in mortality.

STECF conclusions

STECF acknowledges that the general skate and ray TACs may not offer adequate protection for stocks that require reductions in F and conversely, may limit catch opportunities for stocks in good condition. There are also potential impacts on skates and rays management when the landing obligation is applied from 1 January 2019.

STECF acknowledges that data limitations exist for skate and ray stocks, and concludes that the nature of these limitations and the stocks to which they apply need to be better identified. STECF highlights that the main impediment to setting more specific TACs is the lack of evidence in terms of total catch (landings + dead discards). Similarly, more detailed catch information is needed to assess the utility of spatio-temporal, effort and other management measures.

STECF acknowledges the progresses achieved by ICES, which produced advice for 33 stocks of skates and rays in 2017. However, in most of these cases the absence of discard data prohibits catch advice. STECF concludes that emphasis should be given on utilising what discard information and survival information is available, applying the same protocols as with other stocks. This will identify those stocks for which data are sufficient to assess management options. STECF considers that this work is of sufficient scale to warrant a follow-up EWG that would focus on collating stock specific discard information and use survey data as a validation for species identification. Socioeconomic considerations could also be included..

STECF observes additionally that, assuming the approach used in recent years for implementing the Landing Obligation continues, any available discard data will be utilised as part of the TAC adjustment process when skates and ray stocks come under the Landing Obligation in 2019.

STECF concludes that when reporting on survival studies it is preferable to include the method applied and an assessment of the quality of the estimates using the critical review process developed by ICES WKMEDS. STECF concludes that evidence on discard survival of skates and rays is limited to a few métier-area-species combinations. Because the factors that influence survival are poorly understood, extrapolation across species,

fisheries and areas is difficult, and more practical studies to estimate discard survival of skates and rays for key fisheries are needed.

STECF concludes that there is potential to improve selectivity towards skates and rays. To date, there are only few trials in European fisheries which have focussed on improving gear selectivity towards skates and rays, however, the incentive to avoid catches of skates and rays may increase with the implementation of the Landing Obligation.

STECF concludes that the development of transparent criteria is needed to classify species as prohibited in the TACs and quota regulations.

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4.4 EWG 17-17 Compilation of the new DCF Annual Report template

Request to the STECF

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

STECF response

The tasks of the STECF Expert working group (EWG 17-17) were carried out in two consecutive meetings, part 1 and part 2. Part 1 defined the Annual Report templates and a guidance document for Member States on how to fill them and for STECF on how to evaluate them. Part 2 dealt with the testing of procedures for automatic checking of the consistency between the Work Plans (WP) and the Annual Reports (AR). STECF EWG 17-17 part 1 met 16-19 of October and part 2, 23-26 of October 2017. Both meetings were held in Brussels.

Article 11 of the DCF Regulation (EC) 2017/1004 requires Member States to submit annually to the Commission a report on the implementation of their national work plans (WP). A new Annual Report (AR) template is needed from 2018, to allow comparison of implementation against planning of the data collection as described in the WPs.

The Terms of Reference of the meetings were to produce the new Annual Report template for submission by MS, guidelines to be followed by MS and for STECF in their evaluation as well as to define automatic checks of submitted information in the AR. In addition, the EWG was asked to highlight information that may be missing and how these gaps could be addressed through future reporting.

The final reports of the meetings were not available in time for the plenary. The STECF advice is therefore based on the draft versions as of the 6 of November 2017 together with a presentation and discussion with the chair of EWG part 1.

STECF observations

STECF observes that the outcomes of the meetings consist of a EWG report, Excel tables for the submission of Annual Reports (AR) by MS, a Guidance document to facilitate the submission and evaluation of ARs, as well as a *CheckTemplate* of defined automatic checks for each table of the AR. The EWG suggests three approaches (further explained below) to be used independently or in combination that could be adopted for applying the checks of the *CheckTemplate*.

Draft new Annual Report (AR) template

STECF observes that the draft new Annual Report (AR) template mirrors the Work Program (WP). This enables checking for conformity between the AR and WP, which is an important improvement from previous annual reports (STECF EWG 17-04). STECF notes that the EWG was asked to follow the legally binding structure of the WP but since this structure can potentially be revised in the legislation after 2019, the EWG also suggested changes and modifications to the WP.

STECF notes that both AR and WP development could be seen as a process of continuous improvement. On this end the EWG put forward an additional data table for the AR. The aim of this new Table 1F(a) is to provide an overview of other data collection performed by Member States that could be used for future determination of the impact of fisheries on the marine ecosystem (excluding incidental by-catch that is reported under 1F). The data asked in this table is collected under the control regulation (EC) 1224/2009 (VMS, logbook information etc.). Additionally, in the case MS carries out stomach sampling under some dedicated sampling programs, this information should also be stated here.

Guidance for submitters and evaluators of the AR

The guidance document for submitters and evaluators of the AR was considered useful by the national experts attending the EWG. STECF notes thus that this document is expected to help Member States filling in each section of the AR. It also contains a specific section for evaluators on what aspects to check for in the evaluation. Furthermore, it provides guidance for MS and evaluators on how to fill the text box related to quality assurance of data.

CheckTemplate and automatic checking

STECF observes that a list of different checks to be applied for the AR (completeness, timeliness, internal consistency etc.) was produced. From this a *CheckTemplate* spreadsheet was produced, listing the different checks for each field of each AR table. The *CheckTemplate* provides the guidelines for programmers to develop a system for data checking of the AR.

STECF notes that three approaches are proposed (to be used independently or in combination) that could be adopted for applying the checks stated in the *CheckTemplate*:

1. *Excel spreadsheets* including examples of different functionalities (drop down menus, automatic fill cells etc.)

2*. R code for validation*

An open-source and transparent tool to end-users was developed.

3*. Web based application*

A database and a web based application was set up as a trial.

The EWG provided worked examples and options of how automated checking can be further developed. It discussed the pros and cons of the different systems but did not advice on what approach the Commission should move towards implementing.

Regional database

STECF notes that detailed biological sampling data from three Regional Coordination Groups (North Atlantic, North Sea & Eastern Artic and the Baltic), is stored in a common format in the regional database. STECF further notes that for the Mediterranean and Black Sea region, the implementation of the regional database is still under discussion.

There is currently no regional database for the RCG for large pelagics. STECF notes that the regional databases provide a very useful tool to facilitate MS producing tables for the Annual Report.

STECF conclusions

STECF concludes that the STECF EWG 17-17 report referring to both part 1 and part 2 adequately addresses all Terms of References. STECF endorses the outcomes of the EWG. In addition, the STECF discussed the following:

STECF concludes that the draft new Annual report (AR) template allows for assessment of conformity through the mirroring of the WP. Regarding reporting on quality of Economic variables, the outcomes of the data quality subgroup of PGECON should be used as a reference. The guidance document would benefit from a hyperlink to the Eurostat ESS standard for quality report as well as the Quality Guidelines for the DCF (Moura, 2016). For biological information, the STECF EWG 17-04 has provided a Quality Assurance Framework based on European standards.

STECF concludes that the *CheckTemplate* for each field of all tables provides the basis for programmers to construct automatic checks of the ARs. STECF highlights that it is important to find a balance between flexibility and user-friendliness for the submitters and the necessary consistency between required and submitted information when constructing automatic checks.

STECF concludes that the guidance document provides useful guidance for both MS in their submission of ARs and for the STECF as evaluators of the AR.

STECF reiterates its opinion (from STECF EWG 17-04) and supports the recommendation from the RCG (ToR 6.9) that regional databases should be used to facilitate MS producing tables for the Annual Report. In addition the regional databases could be used for a number of purposes, including:

- Make pre-written RDB data extraction routines available to MS so they can insert the data into the AR template themselves,
- Directly cross-checking data submitted for the Annual Report,
- Providing a complementary data source and reports for Annual Report evaluators to use.
- Providing automatically-generated overviews on e.g. sampling coverage, which provides useful generic information to end-users as part of the quality assessment.

STECF concludes that the two main unresolved issues of the EWG of i) the sampling strategy for biological data from commercial fisheries (tables 4a and d) and ii) data to assess impacts of Union fisheries on marine ecosystems (table 1F) should be further explored by the STECF EWG 17-13.

STECF concludes that the Commission needs to ensure that a workable solution for the automatic checking can come into place in due time before the submission of the AR 2018.

STECF concludes that a database with a web-based application would likely be the preferred option for submission and automatic checking of ARs, as this would provide more flexible functionalities, such as direct comparisons between the Work Plans (WPs) and the Annual Report (AR), consistency checks between years, submission of additional data without the need to resubmit the entire AR etc.

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

5.1 Horse mackerel- delegated TAC system

Background provided by the Commission

To review the effectiveness of the delegated TAC system, as applied to the horse mackerel stocks in Madeira, Azores and the Canary Islands.

Request to the STECF

The STECF is asked to evaluate:

1. The extent to which the data collected and assessed by the Member State concerned, on which the TACs adopted are based, are scientifically robust
2. The extent to which the exploitation of the stock and the setting of the TAC are consistent with the precautionary approach to fisheries management

The STECF is also encouraged to look into any additional scientific information for the stocks concerned, if available, to examine whether this alters the perception of the evaluation above.

Background information provided by the Commission

Information provided by Portugal and prepared by the Department of Oceanography and Fisheries of the University of the Azores and regional Fisheries Department of Madeira.

Information provided by Spain and prepared by the Spanish Institute of Oceanography

Background information is provided on: https://stecf.jrc.ec.europa.eu/plen1703

STECF response

STECF notes that the request refers only to "horse mackerel" whereas the fisheries and TACs include two species of the genus Trachurus, and not specifically to *Trachurus trachurus*, the species commonly known as horse mackerel. The STECF response considers thus also the species *Trachurus picturatus,* commonly known *as* blue jack mackerel

Summary of background information provided to STECF

Azores

Portugal has provided information on the data collected in the Azores under the Data Collection Framework (DCF) in 2015. It refers to data collected in 2015 since the report is from March 2017, and thus does not report on the 2016 data. Nevertheless, some of

the figures are similar to ICES advice, which includes 2016 data (see below; ICES, 2017a,b).

Portugal states that blue jack mackerel (*Trachurus picturatus)* is the only species of the genus *Trachurus* found in the waters of the Azores. Total catches of blue jack mackerel have steadily decreased since 1980 from 4000 tonnes to an average of 1150 tonnes since 2012. No change in length composition of catches is observed, and juvenile fishes are targeted by the purse seiners (aged 0 and 1, 8-18 cm).

Standardized LPUE and CPUE for two fleets, small purse seiners (≤12 m) and for catches of jack mackerel with purse seines for use as live bait by the tuna seiner, respectively, are presented as indicative of stock status. No information is provided on the methodology used to standardize the LPUE and CPUE. The report states that the CPUE of the tuna seiner fleet may be considered a good indicator of the condition of the stock, as the activity of the tuna seiner fleet is not restricted by catch limits, which is the case of the small purse seiners (≤12 m; see next paragraph) since the end of 2014. It is also stated that both CPUE time series "*show similar upward trends in abundance over the last three years*" (2013-2015).

The Azores administration put in place in October 2014 a specific management measure for the purse-seine fleet to regulate markets: only 200 kg of jack mackerel per vessel and per day is allowed, while fishing and consequent landing is forbidden on weekends.

Portugal concludes that the "*management measures are adequate and sufficient to maintain the resource at a sustainable level of fishing and within safe biological limits*". Therefore the 2017 TAC was set at the 2016 level of 3072 tonnes. Total catches of jack mackerel have been below the TAC since 1990.

Madeira

Portugal has used the information collected on blue jack mackerel in Madeira in the period 2009-2016 to provide estimates of total mortality using Beverton & Holt's yield per recruit model.

Exploitation rate in 2016 was estimated to be 0.80 per year, fishing mortality was 1.31 and natural mortality 0.335 (Pauly's method). Exploitation rate has decreased until 2014 to 0.55 but has increased since then. Portugal concludes that "*the stock is being exploited at a rate above the maximum yield and therefore above its sustainability limit*".

No information on jack mackerel catches is provided. The 2017 TAC was set at 955 tonnes. Portugal concludes that "*there had been an increase of around 11 % in the fishing rate compared with the previous year, so the TAC has been set 10 % lower than in 2016*".

Canary Islands

Spain reports that catches in the Canary Islands includes two species: *Trachurus picturatus (jack mackerel)* and *T. trachurus (horse mackerel)*, although the first is the most declared and caught in very high proportions (at least 90% since 2013). Horse mackerel appears only occasionally in sampling for jack mackerel, which indicates that the majority of *T. trachurus* landings are likely misidentification. Nevertheless, both species are considered together when declaring catches of "horse mackerel" (*Trachurus spp*). Catch sampling only started in 2013.

Total catch of horse mackerel (*Trachurus spp*) has average at 620 tonnes annually between 2013-2016. Catch length has decreased between 20-25 cm in 2010 to 15-20

cm in 2016. The same 2016 TAC of 1 168 tonnes was set for horse mackerel in the Canary Islands for 2017.

STECF observations

Stock identity

The TACs for so-called "horse mackerel" in EU TAC regulations and delegated to Member States refers to several species of the genus *Trachurus*, and not specifically to *Trachurus trachurus*, the species commonly known as horse mackerel.

Catches of *Trachurus* in the Azores (information provided by Portugal) and Madeira archipelago (Morato, 2012) are made (almost) exclusively by blue jack mackerel (*Trachurus picturatus*). Also, in the Canaries catches are predominantly (more than 90%) composed by blue jack mackerel, with likely less than 10% of catches composed by horse mackerel (*Trachurus trachurus*). In the Azores and Madeira, the fisheries target predominantly juveniles, while in the Canaries adult fish are caught, although mean length of the catch in the Canaries is decreasing.

Blue jack mackerel (*Trachurus picturatus*) stock differentiation in the Azores, Madeira and Canaries archipelagos has received a research focus recently. Based on parasites infection, Vasconcelos et al. (2017) suggested the existence of three stocks in the northeast Atlantic: one in Portuguese mainland waters, one in Madeira archipelago and another in the Canary archipelago, while the Azores was not included in the analysis. Moreira et al. (2018), based on otolith microchemistry, suggest that Portugal mainland, Azores, Madeira, and Canaries should be regarded as different population units. On the other hand, ICES provides advice on *T. picturatus* only in the Azores, but no specific information is (yet) given to support (or not) a separate stock in this area. ICES refers that "no studies specifically addressing the existence of distinct populations in the distribution range of this species have been attempted so far" (ICES, 2017a). STECF notes however that the results of the recent stock identification studies suggest that the three different management areas set to each of Azores, Madeira and Canary archipelagos seemed to be appropriate.

Stock assessment

For subdivision 10.a.2 (Azores), ICES advises that when the precautionary approach is applied, catches should be no more than 1098 tonnes in each of the years 2017 and 2018 (ICES, 2017b). ICES evaluates the stock size and fishing pressure to be stable in the last 3 years (Figure 5.1.1). However, the indices based on standardized LPUE and CPUE show different recent trends (Figure 5.1.2). A decrease in biomass index has been observed for the small seiners since 1980, with 2016 being the lowest value of the time series. For live bait for tuna seiner, the index has been somewhat stable since 1998, and now recently increasing from its historical low in 2012.

Due to the lack of MSY reference points, STECF is not able to assess whether blue jack mackerel in the Azores is currently being exploited at a rate that is consistent with maximum sustainable yield. However, in relation to the precautionary approach, the stock size and fishery seems to be stable.

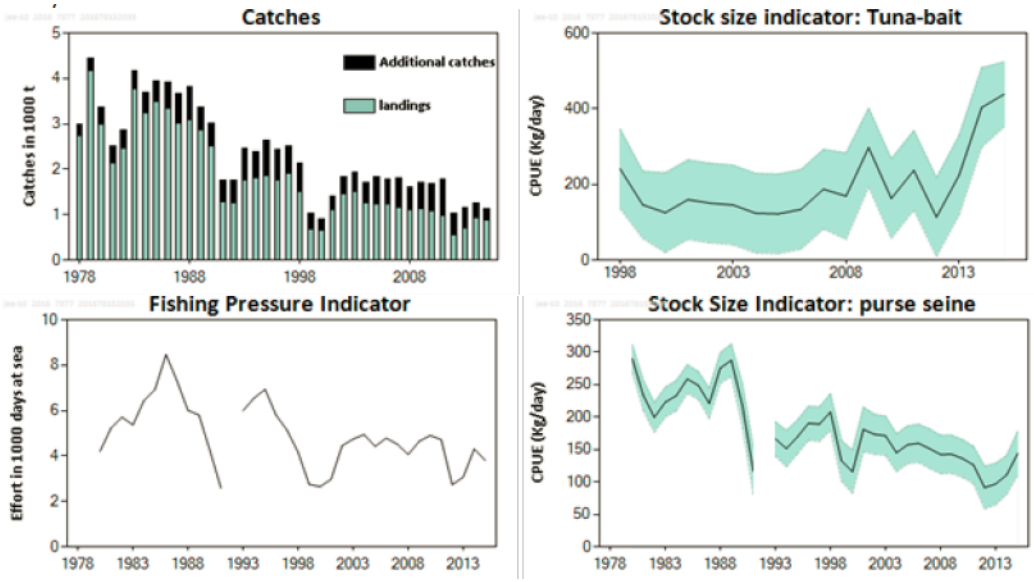

Figure 5.1.1. Blue jack mackerel in Subdivision 10.a.2. Top left: official landings (artisanal purse seine fishery and hooks and lines) and ICES estimates of additional catches (longline bait, tuna live bait, withdrawn landings at port, and recreational). Bottom left: Total effort (thousand days at sea) for the artisanal purse seine fleet. Top right: catch per unit effort (standardized CPUE, kg/day) from the tuna bait fishery with 95% confidence intervals. Bottom right: landings per unit effort (standardized LPUE, kg/day) artisanal purse seiners on juveniles with 95% confidence intervals (adapted from ICES, 2017b).

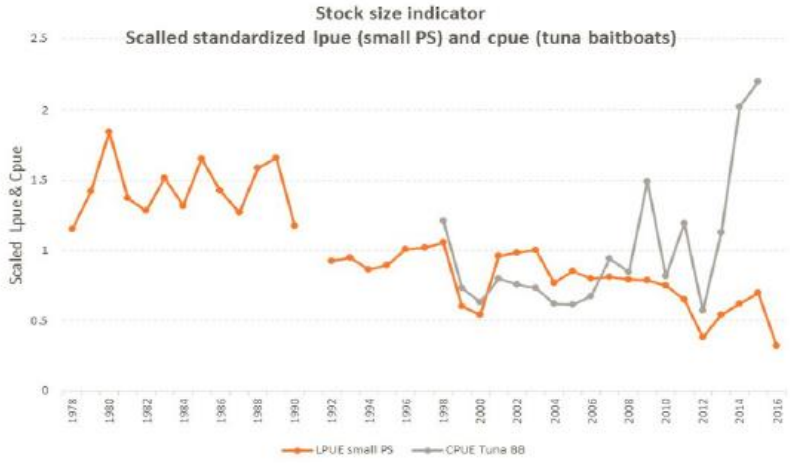

Figure 5.1.2. Blue jack mackerel in Subdivision 10.a.2. Scaled standardized lpue from small purse seiners and standardized cpue from the baitboat tuna fishery (ICES, 2017b).

For Madeira, Portugal provided for the first time an assessment based on a surplus production model, which concluded the stock is being exploited at a rate above the maximum sustainable yield. This assessment has not been presented to ICES yet. STECF welcomes the assessment provided and notes that the assessment methodology carried out is likely appropriate considering the available data. Nevertheless, the results should be viewed with caution since no uncertainty is accounted for in the assessment, while no CPUEs are available to indicate stock abundance trends. STECF notes that in Madeira,

blue jack catches have varied between 300 and 600 tonnes for the past 16 years with no apparent trend (Figure 5.1.3).

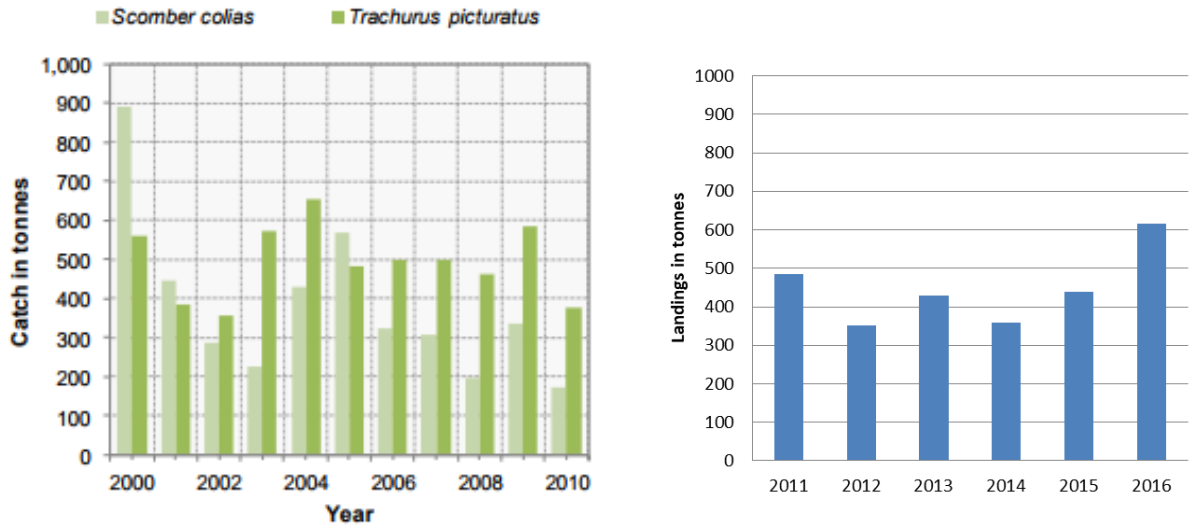

Figure 5.1.3. Blue jack mackerel catches in Madeira archipelago: left between 2000 and 2010 (Morato, 2012) right between 2011 and 2016 (https://estatistica.madeira.gov.pt/).

For the Canary region there is still no scientific advice available to STECF. Given the absence of any assessment and the short data time series available (Figure 5.1.4), STECF is still not able to assess whether exploitation of blue jack mackerel in the Canary Islands is currently a rate that is consistent with maximum sustainable yield or in accordance with the precautionary approach.

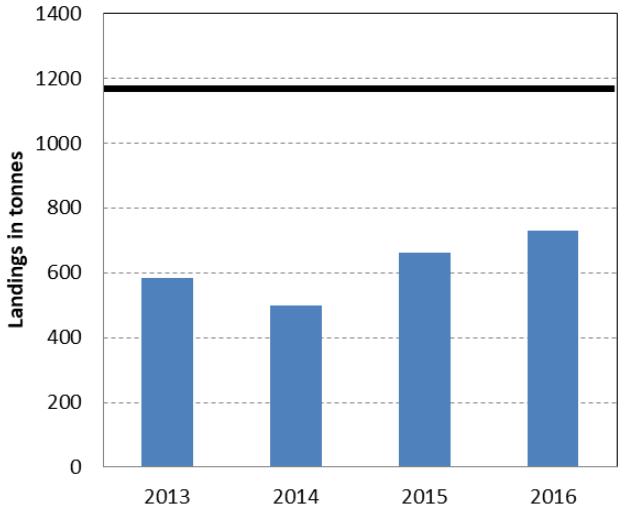

Figure 5.1.4. *Trachurus* spp. catches in Canary Islands (information provided by Spain). The solid line represents the TAC set at 1 160 tonnes.

In summary STECF notes that there are assessments provided for blue jack mackerel in the Azores and for the first time in Madeira, while in the Canary Islands an assessment is not provided due to the short time series. STECF suggests that collating a CPUE time series could potentially improve the robustness of the Madeira assessment. A stock assessment in the Canary Islands should be attempted.

Delegated TACs

Regarding the level of the TACs set, the TAC for *Trachurus spp.* in the Azores has not changed since 2010, at a value of 3 072 tonnes. STECF notes that this is not consistent with the historical advice from ICES and particularly the one given for 2017, which implies that catches should not exceed 1 098 t.

The TACs set for Canary and Madeira have changed little since 2010 when they were both set at EU level at 1 229 tonnes. Since then, the TAC set for Madeira has been decreased by 22% (to 995 t in 2017), while the TAC for the Canary Islands has been decreased by 5% in 2011 (to 1 168 t) and set at the same level since then. All three TACs set have not limited catches for at least the last 5 to 10 years.

Considering the above, STECF therefore notes that the national TACs set will likely continue to not limit the fisheries in question, and thus STECF considers that the setting of the TAC are inconsistent with the precautionary approach to fisheries management.

STECF conclusions

STECF concludes that the three different management areas set to each archipelago currently adopted are appropriate and are consistent with the results of recent research on stock identity of blue jack mackerel (*T. picturatus*) around the three archipelagos.

ToR 1. The extent to which the data collected and assessed by the Member State concerned, on which the TACs adopted are based, are scientifically robust

STECF notes that the data collected following the requirements specified in the DCF national programmes, in which the Azores, Madeira and Canaries sampling are included, would in principle be scientific robust STECF suggests a revisiting of the Madeira assessment with the inclusion of CPUE series, and a first attempt of assessing the stock in the Canary Islands.

ToR 2. a) The extent to which the exploitation of the stock are consistent with the precautionary approach to fisheries management

Blue jack mackerel in ICES Subdivision 10a2 (Azores): STECF notes that the estimated catches over the period 2013-2015 were 1153 tonnes, 1199 tonnes and 1136 tonnes respectively (ICES estimates). ICES advises that when the precautionary approach is applied, catches should be no more than 1098 tonnes in each of the years 2017 and 2018. Hence If catches in 2017 and 2018 remain at or about the recent level, they will be less than those advised by ICES and the exploitation rate on the stock is likely to be consistent with the precautionary approach to fisheries management.

Blue jack mackerel in FAO 34.1.2 (Madeira): STECF concludes that the recent exploitation rate on the blue jack mackerel stock in the waters of Madeira (FAO 34.1.1) is not consistent with the precautionary approach to fisheries management and is likely to have been above the rate that would deliver the MSY.

Blue jack mackerel in FAO 34.1.2 (Canary Islands): STECF cannot assess the exploitation status of the blue jack mackerel stock in the Canary Islands.

ToR 2. b) The extent to which the setting of the TACs are consistent with the precautionary approach to fisheries management

Blue jack mackerel in ICES Subdivision 10a2 (Azores): The annual TACs for jack mackerel in the waters surrounding the Azores (ICES Subdivision 10.2.a) have remained constant at 3200 tonnes from 2003- 2016. Such a level of TAC exceeds both the estimated catches in those years and the catches advised by ICES for the years 2012-2016. The ICES advice for 2017 and 2018 is that annual catches should not exceed 1098 tonnes. STECF concludes that the proposed TAC for 2017 of 3200 tonnes is not consistent with the precautionary approach to fisheries management.

Blue jack mackerel in FAO 34.1.2 (Madeira); Given that the recent exploitation rates on blue jack mackerel in the waters surrounding Madeira exceed those which would deliver the MSY and that recent annual catches have been well below (around 50% below) the annual TACs, STECF concludes that while the 2017 TAC set has been reduced by 10% from 2016, it is not consistent with the precautionary approach to fisheries management.

Blue jack mackerel in FAO 34.1.2 (Canary Islands): Total catch of horse mackerel (*Trachurus spp*) has average at 620 tonnes annually between 2013-2016. The same TAC of 1168 tonnes has been set for horse mackerel since 2013. STECF concludes that the proposed TAC for 2017 of 1168 tonnes is not consistent with the precautionary approach to fisheries management.

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5.2 Article 39- of EMFF Regulation (EU) No 508/2014 Belgium

Background provided by the Commission

Article 39 of Regulation (EU) No 508/2014 gives support to innovation linked to the conservation of marine biological resources. Under that article, a Member State may receive financial support for operations aimed at developing or introducing new technical or organisational knowledge that reduces the impact of fishing on the marine environment, including improved fishing techniques and gear selectivity. Article 39(4) of Regulation (EU) No 508/2014 specifies that: "Fishing vessels involved in projects financed under this Article [39] shall not exceed 5 % of the number of vessels of the national fleet or 5 % of the national fleet tonnage in gross tonnage, calculated at the time of submission of the application. At the request of a Member State, in duly justified circumstances and on the basis of a recommendation by the Scientific, Technical and Economic Committee for Fisheries (STECF) established by Commission Decision 2005/629/EC, the Commission may approve projects that exceed the limits set out in this paragraph."

On 3 April 2017, the Belgian Managing Authority for the EMFF programme sent a first request for increasing the % of the national fleet which may be involved in operations financed under Article 39. It was therein underlined that the Belgian fleet is a rather small fleet consisting of only 72 commercial vessels which represents a total GT of 13.855 thousand tonnes. In number of vessels, 5% equals to approximately 3 vessels.

The request was rejected because it did not provide enough information on the proposed projects to be analysed. DG MARE notified to the Managing Authority on 8 May 2017 that for a derogation under Article 39(4) of Regulation (EU) No 508/2014 to apply, the following information should be provided to the Commission, as a minimum:

- A description of the proposed project(s) with all the relevant scientific, technical and economic considerations supporting the fact that the operations in which the project(s) are included "aim at developing or introducing new technical or organisational knowledge that reduces the impact of fishing activities on the environment, including improved fishing techniques and gear selectivity, or aim at achieving a more sustainable use of marine biological resources and coexistence with protected predators" as stated in article 39.1 of Regulation (EU) No 508/2014.
- An assessment of the conformity of the proposed project(s) with the selection criteria applicable to the specific measure, as approved by the Monitoring Committee, accompanied by the date of approval.
- A justification explaining why a derogation would be needed for running the proposed project(s).

On 19 July 2017, a second application was sent with all the requested documents. Some scientific reports were also attached to the Belgian file as supporting documents. They are in annex of these Terms of Reference. On the basis of the selection criteria that were approved by the monitoring committee in its meeting of 13 April 2016, three projects were selected under art 39 of the EMFF:

- Project 16/UP1/10 about research on the sole stock in the Irish Sea was selected in the selection committee of 05/07/2016.

- Project 17/UP1/03 on research on and monitoring of pulse fishery in the Western Waters was selected in the selection committee of 23/02/2017.

- Project 17/up1/13/div on high survivability of plaice was discussed in the selection committee of 12/05/2017.

Two vessels more than the 3 vessels allowed by the 5% threshold would be required to finance the 3 projects described in annex 1, 2 and 3 under Article 39. One of those projects (16/UP1/10) involving only one fishing vessel is already completed.

This is the first request received by any Member State for derogation to Article 39 and the first use of STECF recommendation in that case.

Background information is provided on: https://stecf.jrc.ec.europa.eu/plen1703

Request to the STECF

Based on the documents presented by Belgium on their 3 projects under Article 39 of the EMFF in annexe, on the available scientific information on the state of the concerned stocks (e.g. ICES latest advice) and on the state of the marine environment in the related areas, the STECF is requested to assess:
1) Whether the selected projects "aim at developing or introducing new technical or organisational knowledge that reduces the impact of fishing activities on the environment, including improved fishing techniques and gear selectivity, or aim at achieving a more sustainable use of marine biological resources and coexistence with protected predators" as stated in article 39.1 of Regulation (EU) No 508/2014;
2) The scientific elements suggesting acceptance or rejection of the request for derogation from the limits set out in Article 39.4 of Regulation (EU) No 508/2014.

STECF response

Summary of the documents provided to STECF

STECF is requested to assess whether the aim of the projects is in line with the aims stated in article 39.1. In order to do so, the Commission provided STECF with the following documents:

- An application letter from the Belgian Management Authorities, including a short description of the projects and an argumentation that all of these projects have the same aims as in article 39.1 and that therefore, the authorities request an exemption from the 5% rule.
- A Background document (in Dutch) with general information on the oceanographic particularities of the Irish Sea and the Belgian fishery in the area.
- The application form of the project on the sole stock (IRIS2 project, in Dutch) including the methodological details of the project, which aims at getting better information on the spatial distribution and population dynamics of the sole stock in the Irish Sea.
- The evaluation of STECF of the project proposal on the sole stock with comments on the methodology and the conclusion that more specific details on the survey design is required in order to determine whether its design is statistically robust and therefore useful for future assessments of VIIa sole.
- A detailed response to the STECF comments in March 2016 on the proposal for the project on the IRIS2 project.
- The application form of the project on the pulse fishing (in Dutch) including the methodological details of the project. The project aims at getting more knowledge about the biological and economic effects of the use of pulse gears in the Irish Sea and is comprised of 5 WP that cover detailed comparison of the catches from

pulse gears with those from the traditional beam trawl, side effects on (mainly) round fish species, comparison of costs and investments and control and compliance.
- An scientific evaluation of the project proposal for pulse fishing by ILVO (in English).
- The ICES WGELECTRA repot on the effects of pulse fishing (2017)
- The application for of the project on plaice survival (in Dutch) including the methodological details of the project. The project aims to provide advice for the sector and policy makers on how to use the derogations to be able to fulfill the landing obligation and to develop the argumentation and data on survival to get the derogations needed. As such a set of survival experiments using the RAMP methodology is planned for autumn 2017.
- Upon request also the final report of the project on the sole stock was available.

STECF observations

STECF observes that this is the first request from the Commission on this area. Article 39 of Regulation (EU) No 508/2014 states that the EMFF may support operations aimed at developing or introducing new technical or organisational knowledge that reduces the impact of fishing activities on the environment, including improved fishing techniques and gear selectivity, or aimed at achieving a more sustainable use of marine biological resources and coexistence with protected predators (art 39.1). However, the (total) number of fishing vessels involved in projects financed under this Article shall not exceed 5% of the number of vessels of the national fleet or 5% of the national fleet tonnage in gross tonnage, calculated at the time of submission of the application (art 39.4).

TOR 1. Whether the selected projects aims are in line with article 39.1 of Regulation (EU) No 508/2014;

Regarding ToR 1, STECF has taken the following approach to assess the applications from the Belgian Management Authorities:
- Assessment of the research objectives of the projects in the application are in line with the aims stated in Article 39
- Assessment of the extent of the request
- Indicate whether the projects as described in the proposals will result in the desired research objectives.

For each of the three projects the points above are elaborated.

Project 16/UP1/10: Irish Sea sole survey

The Belgian Management Authorities provided the application form, the evaluation by ILVO and the final report. The project was carried out in 2016 and aimed at getting more information on the spatial distribution and size distribution of sole in the Irish Sea. The hypothesis is that due to changes in the spatial distribution, the current survey results in biased estimates for the status of the sole stock in the Irish Sea. Areas with relatively higher numbers of young sole were compared to other areas, to identify possible nursery areas for sole in the Irish Sea. A Belgian commercial vessel fished together with the RV Endeavour to explore the suitability of the spatial coverage of the selected stations and the catch composition obtained with this survey. Also, genetic analyses were carried out on the population structure in the Irish sea. STECF considers that the aim to increase the quality of the assessment meet the objectives of Article 39.1 to gain better technical knowledge. Moreover the proposal includes the setting up of a Fisheries-Science-Partnership (FSP) which aims to strengthen the already established partnership and

communication between fisheries scientists and fishermen. This aim is consistent with the aim of article 39 to gain more organisational knowledge.

In this project one vessel carried out one survey in autumn 2016.

The project was aimed to give the input for a) a decision whether such extra tuning fleet is recommended to be continued for 5 years, b) what needs to be adjusted to the design of an industry survey in the Irish Sea.

The IRIS project concludes that the geographical distribution of sole in the Irish Sea is very patchy with "hotspots" of high sole abundance. Fishermen have a good local ecological knowledge of the areas where the fish are and know how to find these patches, based on experience and by copying the behaviour of other fishing vessels. Consequently, because catches in these so called "hotspots" remain high, fishers might get a distorted view and overestimate the status of sole in the broader area of the Irish Sea. In contrast, the scientific survey (BTS) always collects samples in fixed stations. Survey data are used as relative abundance index for tuning the assessment, but commercial catch data are also primary information used in stock assessment.

The IRIS project concludes nevertheless that the industry survey (INS) did not identify other areas of importance for sole in the Irish Sea than those already covered by the British beam trawl survey (BTS). Also, catchability and composition of catches in both BTS and INS were comparable. These results suggest that the BTS gives a good representation of fish abundance and that an annual industry survey additional to this survey would not be of added value to the assessment.

The project also aimed to give insights in the population structure and dynamics by combining different stock identification techniques such as shape analysis and genetic markers. Results suggest there might be subtle geographical differences, but it is not clear whether these differences are real or rather the results of temporal variations in the samples (samples come from different seasons in two different years: May 2015, June 2016 and September 2016) or due to methodological differences (due to difference in sequencing machines: HiSeq 2500 versus HiSeq 4000).
Furthermore, in literature no evidence has been found so far for differences between the Celtic Sea and Irish Sea sole populations using genetic markers (Cuvelier, 2011). This suggests that the Celtic Sea, Bristol Channel and Irish Sea stocks are probably part of one big population. It was also not concluded whether spill-over from the Bristol Channel where recruitment is high (source: ICES advice sole VIIfg) towards the Irish Sea where recruitment is low (source: ICES advice sole VIIa) is taking place. Further investigations are thus needed, for example through elemental composition of otoliths on young fish This has been done before, for instance in Cuvelier et al. (2012) microchemistry of otoliths were combined with shape analysis to efficiently distinguished Irish and Celtic Sea adult fish, with a reassignment success of 78 and 83%.

STECF observes that the aims of this project appear to meet with the project as described above.

Project 17/UP1/03: Pulse trawl project

For this project, STECF was provided with the proposal and the evaluation by ILVO. The project aims to deliver: (i) a detailed direct catch comparison between a conventional beam trawler and a pulse trawler fishing together, (ii) a regular but less detailed sampling of catches during commercial fishing practice of all pulse trawls involved and a representative conventional beam trawl and (iii) a continuous monitoring of the landings,

VMS (Vessel Monitoring System) data and technical parameters on board the pulse trawlers. The project will also investigate possible side-effects of pulse trawls used under commercial conditions, including studies of spinal injuries for roundfish species and of skin damages for dab.

STECF concluded previously that an increase in the proportion of the beam trawl fleet allowed to use pulse trawls in the southern North Sea will reduce catches and fishing mortality for both target an non-target species including benthic organisms, provided that the current characteristics and the use of the gear remain unchanged (STECF 2012). Moreover, WGELECTRA (2015) conducted an independent review on the pulse fishing research and concluded WGELECTRA (2015):

1. *There is further evidence to support the conclusion that the pulse trawl significantly reduces fishing mortality of target and non-target species, including benthic organisms, assuming there is no corresponding increase in unaccounted (avoidance) mortality and that the pulse used is within the limits set out in the legislation.*
2. *There appears to be a general lack of progress in identifying critical pulse characteristics and subsequent testing which would allow conclusions to be drawn on whether the current proposed limits are sufficient or not. Some critical parameters have been identified but there is little discussion or ex-planation as to why these and only these are the critical parameters and why other parameters such as pulse shape that may lead to different impacts are not considered. This remains one of the main unresolved issues and the review group encourages the undertaking of structured experiments that are able to identify the key pulse characteristics and thresholds below which there is no evidence of negative impact.*
3. *The role of specific pulse characteristics have not been tested in a fully systematic manner and therefore the current legislation may not cover all the aspects necessary, it is not possible to ascertain whether the systems used can be adjusted to exceed thresholds that may result in a negative impact or whether the pulse characteristics used under experimental conditions are actually reflective of those used by the fleet.*
4. *Extensive work on mortality and potential sub lethal and reproductive effects on target and not-target species is reported and reviewed by WGELECTRA for both the flatfish and brown shrimp pulse trawls. This work has expended the knowledge base significantly and provided more insight into the short and medium term effects on a wider range of species. Other than spinal injuries in cod, the studies largely show little or no adverse impacts on the different species tested.*
5. *The research carried out has established no direct link between the use of the pulse trawl and lesions on the skin of sole or dab. However, other research has provided conflicting results. The review group encourages further research in this area.*
6. *The pragmatic, albeit subjective, analysis on the potential impacts of pulse trawls on individual species in NATURA sites/listings in the absence of quantitative observations, provides a useable frame work to assess potential levels of risk. However, it is considered that such comparisons would be better supported by a more structured synopsis that could be used as a cross reference between species with similar characteristics and therefore used as proxy indicators.*

STECF (2012) also recommended that any extension of the pulse fishing area should be considered only after an impact assessment on the effects of the pulse trawl on the

ecosystem, in particular when species not subject to a prior impact study, such as *Nephrops*, could be encountered by the gear.

The proposed fishing trials with pulse gears in the English Channel and the Celtic Sea will gain information on the effects of the pulse trawl in these areas and by that add to the knowledge needed to assess whether pulse trawls reduce the impact of fishing activities on the environment relative to conventional beam trawling in this area. As such the project aims meet the objectives of Article 39.1.

With respect to the number of vessels needed to perform the project, the national research proposal mentions that 2-3 vessels equipped with pulse gears will be involved in the proposal and 1-2 conventional vessels will be used as reference vessels. In the application from the Management Authorities 3 vessels are mentioned, but it is not clear whether this number refers to 3 vessels with pulse gear or to 2 vessels with pulse gear and 1 vessel with conventional gear.

Based on the description of the projects it is not clear whether all the stated objectives will be met by the results of the research activities. The statistical underpinning for the requested number of vessels is lacking. Therefore, it is not clear whether there is a scientific need for three vessels with pulse trawls in this project.

Project 17/up1/13/div: Plaice survivability
For this project only the application form was available, due to the fact that the evaluation of the proposal was not finalised yet. Moreover, the application letter stated that the applicant will provide additional information, but this was not provided to STECF.

STECF observes that the objective of the project was much broader than to obtain knowledge on the survival of unwanted bycatches and included various actions to get insight in how the various derogations could be used to allow the Belgian sector to comply with the Landing Obligation and to assure a stable market supply and a viable fishery. However, the information on the survival of plaice is seen as an essential element in the so called "survival scenario" that the Belgian fisheries sector foresees for the implementation of the Landing Obligation. Information on the survival of the fish will add to the knowledge base on the impact of the fishery in terms of the fishing mortality of plaice, inform on factors that affect discard survival, which may offer measures to increase survival of unwanted catches, as well as providing evidence for the proper implementation of the landing obligation. As such the project aims would expect to meet the objectives of Article 39.1.

In order to carry out the survival experiments three trips will be made by one vessel. No explanation is given on the number of fish that will be sampled and the consequences for the statistical quality of the outcomes.

<u>TOR 2: scientific elements suggesting acceptance or rejection of the request for derogation from the limits set out in Article 39.4 of Regulation (EU) No 508/2014.</u>

The wording of article 39.4 does not specify clearly if the threshold refers to the cumulated number of vessels across all years and projects or for each individual project. After consultation with DG MARE, the STECF has evaluated the ToR as that the threshold applies for all cumulated vessels across all years and projects.

STECF observes that the total number of vessels involved in the projects is 1 + 3 + 1 = 5 vessels. This is 2% more than the 5% threshold that is mentioned in art 39. However,

the vessels will not operate in the projects at the same time. Moreover, as one of the projects is already finished, the number of vessels in the remaining project is 4 which is only 0.5% above the threshold. However, statistical justification for the requested number of vessels is lacking in the three proposals.

STECF conclusions

Based on the information provided, the STECF concludes that all the topics of the trials can be considered in line with the objectives stated in article 39.1.

STECF concludes that from the available information it is difficult to evaluate whether the pulse proposal and the survival experiments will result in significant outcomes that will add new information to the existing knowledge base. It is also unclear how the necessary number of vessels has been estimated and what justifies the number of vessels to be included in the application. STECF suggests that in future applications, the justification for the requested number of vessels is made explicit.

STECF also concludes that the extent of the derogation that is requested by the Belgian Management Authorities is limited. The total number of vessels in the trials comprise at max 7% of the total fleet, only 2% above the limit. Moreover, two of the vessels activities are limited to a few fishing trips, whereas the vessels for the pulse trials will be using pulse trawls for the coming 3 years.

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5.3 Undulate ray in ICES area 9

Background provided by the Commission

In 2015, the STECF were asked to suggest by-catch quotas for undulate ray (Raja undulata) management in ICES areas 7, 8 and 9. STECF responded (STECF 15-03) reviewing different management options and suggesting limits on landings for several areas. The Commission subsequently proposed a series of precautionary Total Allowable Catches (TACs) for undulate ray, which were in turn adopted by Council. In 2016, separate precautionary TACs for undulate ray were adopted for both areas 8 and 9, respectively.

STECF 15-03 highlighted the lack of data and catch history for undulate ray, particularly in area 9. Since 2015 several scientific studies have been conducted by various Member States to assess the abundance and catch per unit effort of undulate ray. Member States have also implemented and updated their management and regulation of undulate ray fisheries. The Portuguese authorities have recently provided the attached report on their findings in ICES area 9a.

In light of this updated scientific work and management, STECF is requested to review the current precautionary TAC for undulate ray in Union waters of ICES area 9.

Background information is provided on: https://stecf.jrc.ec.europa.eu/plen1703

Request to the STECF

The STECF is requested to:

1. Peer-review the updated scientific work and management on undulate ray provided by Portugal.
2. Assess if the updated management, scientific data and analyses are sufficient to review and amend the current TAC for undulate ray in area 9.
3. Provide an explicit level of total allowable catch for the 2018 Fishing Opportunities for undulate ray in area 9.
4. Suggest what data collection, studies or monitoring is required to further manage this fishery at sustainable levels.

The STECF is also encouraged to look into any additional scientific information for the stocks concerned, if available, to examine whether this alters the perception of the evaluation above.

STECF Response

Introduction

Undulate ray (*Raja undulata*) is captured in large quantities as bycatch in the mixed species trammel net fishery that operates off the southern coast of Portugal (Coelho et al., 2002) and is the most common skate species caught by the fishery (Erzini et al., 2001, Coelho et al., 2005). It has life history traits that are characteristic of elasmobranchs (slow growth, late maturity, long life spans, low fecundity) which renders the species extremely vulnerable to over-exploitation (Stevens et al., 2000). In particular, undulate ray has a slower growth rate compared to most species of *Raja*

(Coelho and Erzini, 2002). Furthermore, its large size, which indicates a low intrinsic rate of population increase and high trophic level, may render it more vulnerable to depletion from exploitation than smaller skate species (Dulvy et al., 2014). It is included in the IUCN Red List as "Endangered" species.

In 2009, the EU added *R. undulata to* the list of prohibited species (Council Regulation EU No 53/2010). Following claims that the addition of *R. undulata* to the EU prohibited list had negative socio-economic repercussions on local and coastal artisanal fisheries, that the species was locally abundant in some places and the efforts undertaken by fishermen to participate in new studies, *R. undulata* in ICES areas 7 and 8 was removed from the list of prohibited species in 2014 and similarly for area 9 in 2015.

In 2015, the STECF was requested to suggest by-catch quotas for undulate ray in management in areas 7, 8 and 9 on the basis of a report prepared under ad hoc contract. STECF responded (STECF-15-03) reviewing different management options and suggested upper limits for landings from several areas. The Commission subsequently proposed a series of precautionary Total Allowable Catches (TACs) for undulate ray, which were in turn adopted by the EU Council. In 2016, separate precautionary TACs for undulate ray were adopted for both areas 8 and 9. In particular, Council Regulation 2016/72 stated that "*Scientific advice received from the STECF indicates that it is in line with the precautionary principle to allow a small by-catch quota for undulate ray (Raja undulata) in ICES subarea IX*". Specifically, the Commission authorized by-catch limits of 12 tons (2016) and 15 tons (2017) for *R. undulata* in Portuguese continental waters "***to ensure the continuity of scientific studies and to assess the state of the resource and ensure, in the future, its sustainable exploitation***" (Council Regulation EU 2016/72 and Council Regulation EU 2017/127).

However, STECF 15-03 highlighted the lack of data and catch history for undulate ray, particularly in area 9. In particular, STECF 15-03 noted that "*If managers decide to permit either a sentinel or limited commercial fishery, then this would require close monitoring of catch and effort data, including the monitoring and documentation on gear parameters and actual effort e.g. length of nets deployed and associated soaking time. To facilitate the development of spatial management measures, data on the spatial distribution of catch and effort data should be collated*". Since 2015, several scientific studies have been conducted by various Member States to assess the abundance and catch per unit effort of undulate ray. Member States have also implemented and updated their management and regulation of undulate ray fisheries.

The Portuguese authorities have provided a report entitled "Monitoring plan on *Raja undulata* population status along the Portuguese continental waters (ICES Division 9.a) - 1st year" by Ivone Figueiredo and Catarina Maia (IPMA). In light of this updated scientific work and management, STECF is requested to review the current precautionary TAC for undulate ray in Union waters of ICES area 9.

Background documents:

"Monitoring plan on *Raja undulata* population status along the Portuguese continental waters (ICES Division 9.a) (1st year: 2016)" (April 2017). Report submitted by Portuguese authorities to STECF

STECF-15-03 report "Possible by-catch provisions for undulate ray in ICES areas VIIde, VIIIab and IX". Report available online. https://stecf.jrc.ec.europa.eu/reports

ICES WGEF REPORT 2017 (ICES Report of the Working Group on Elasmobranchs 2017): Report available online. www.ices.dk/

TOR 1. Peer-review the updated scientific work and management on undulate ray provided by Portugal.

The report on the population status of undulate ray in Portuguese continental waters by Figueiredo and Maia provided by Portuguese authorities to the STECF is a short document describing briefly the main results from the 2016 monitoring plan in ICES Division 9.a. STECF notes that a more complete report was submitted to ICES in 2017 (ICES WGEF REPORT 2017), but not to STECF. In addition, the final report of the UNDULATA project carried out by the *Instituto Português do Mar e da Atmosfera* (IPMA) in Portugal has been completed but was not provided to the STECF.

STECF notes that the monitoring plan adopted by IPMA in 2016 has provided preliminary information on the spatial and bathymetric distribution of undulate ray in area 9a using CPUE data. The data collected in 2016 are based on catches of undulate ray taken during fishing operations targeting other species. The results indicate that undulate ray is not uniformly distributed but has a patchy distribution within the coastal zone (< 50 m). The results also indicate that higher CPUE values are obtained from hauls carried out over sandy bottom habitats in the Southwest region of the Portuguese continental waters.

STECF notes that the monitoring program established by Portugal follows a self-sampling scheme. Licensed vessels are obliged to report data on *R. undulata* catches on the eighth day of each month to both IPMA and to the Portuguese General Directorate for Natural Resources, Safety and Maritime Services. In principle, catch data should be reported on a haul-by-haul basis and hauls with zero catches should also be reported. The information that should be collected and reported for each haul includes: date; geographic locations; technical characteristics (number and mesh size of the gear, fishing haul duration; total catch of undulate ray in number and in weight; total number of specimens with total length smaller than 780mm and larger than 970mm. Additionally (not mandatory), the number of reproducing females should be gathered.

The 2016 monitoring report provided by the Portuguese authorities include different data such as the number of reported fishing hauls for each region by month, the geographic location of the fishing hauls reported by region (spatial distribution of hauls are provided in the maps), fishing hauls with positive catches, number of specimens caught in each trammel net fishing hauls by region, mean fishing effort, standard deviation, mean CPUE and mean distance to coast for trammel nets hauls performed with mesh sizes <150mm and >150mm and considering the soaking time (h) as unit of fishing effort, CPUE estimates by month and its standard errors and sediment type distribution (by region).

STECF notes that the 2016 monitoring report has some shortcomings regarding the data collected and analysed: (i) some fishermen appear to have misunderstood the information required, particularly regarding the requirement to report the hauls with zero catches of undulate ray; (ii) no individual fish length data seems to have been recorded; (iii) results of the report indicate that "number of gear" and total catch in weight were not collected (or at least were not analyzed), (iv) the unit of fishing effort utilised in the report only refers to soak time (in hours) but not the length of the trammel nets (STECF notes that for set nets it is advised to gather information on the length of the net deployed; STECF-15-03)

STECF agrees with the report statement that *"The role of fishermen in the monitoring process is a key element and they need to be aware of their importance on the process,*

in particularly on providing good and reliable information". However, to ensure that the shortcomings identified above in the 2016 monitoring report, it is essential that appropriate training on data collection is provided.

STECF notes that while the 2016 monitoring report states that undulate ray may have high socioeconomic importance for small-scale fisheries (SSF) in Portuguese coastal waters, no socio-economic data was provided in the report in support of such a statement.

STECF notes that the available fishery dependent and independent data are insufficient to undertake an assessment of stock status for undulate ray in area 9. Landings data are provided by ICES in area 9a for 2005, 2006, 2007 and 2016 (no data for 2008-2015; table 19.2 of the ICES report). Furthermore, there are estimations of landings from 2003-2008 by Maia et al. (2013) (table 19.12 of the ICES report). The values from these two ICES tables are reported below (Table 5.3.1). STECF notes some inconsistencies between these two tables (e.g. for 2006 there are 119 t landed but the estimated values for 2006 was 271.3 t), the reasons of which are unknown.

Table 5.3.1. Undulate ray landings area 9a (Iberian waters: Portugal and Spain), in tons. From ICES WGEF 2017.

Year	ICES estimates	Maia et al. (2013) estimates
2003		164
2004		197
2005	100	172
2006	119	271
2007	277	157
2008		208
2009		
2010		
2011		
2012		
2013		
2014		
2015		
2016	31	

The absence of a consistent time series of landings estimates of undulate ray precludes any time series analysis of historic catch or LPUE. Furthermore, stock status and trends

cannot be evaluated from survey data because there is only one year of fishery-independent data (2016) presented in the monitoring report. Hence the information available is insufficient to determine current stock status or any temporal trends.

STECF notices that on the basis of Council Regulation (EU) 2016/72 of 22 January 2016, Portugal introduced National legislation authorizing a by-catch quota of 12 tonnes for *R. undulata* in Portuguese continental waters for 2016 (Portaria no 96/2016, April 2016). Similarly, the quota for undulate ray in 2017 was set at 15 tonnes.

According to the report presented by the Portuguese authorities, the Portuguese law states that: *i) only vessels possessing a special fishery license were allowed to catch R. undulata; ii) the skippers of the licensed vessels authorize the onboard presence of IPMA scientific observers for data collection; iii) licensed vessels are obliged to gather and report information on R. undulata capture by fishing haul; iv) only specimens over 780mm and smaller than 970mm in total length are allowed to be landed; v) daily landings should not comprise more than 20 Kg live weight per fishing trip and; vi) the landing prohibition during the months of May and June.*

STECF notes that daily catches in weight and haul and length measurements (provisions iv and v above) are not provided in the 2016 monitoring report. Hence it is not possible evaluate whether the daily landings limit or the overall quota limit of 12 tonnes for 2016 was achieved or exceeded, or the size limitations were respected.

STECF has noted some inconsistencies across the various documents. The Portuguese report states that "*daily landings should not comprise more than 20 Kg live weight per fishing trip*", whereas Portaria nr. 96/2016 states that "*a maximum of 30 kg of undulate ray live weight is allowed per trip"*. Furthermore, the Portuguese report states that "*the landing prohibition during the months of May and June"* whereas Portaria nr. 96/2016 states that "*during the months of May, June and July of each year the capture, retention on board and landing of undulate ray is prohibited, but data on catches should be recorded".*

STECF notes that Portuguese authorities allocated in 2016 a total of 49 fishing licenses to small-scale fishing vessels from 10 different fishermen's associations, distributed along the Portuguese continental coast. Total catches or landings for these 49 licenced vessels are not provided.

In the absence of appropriate data and information on catches it is not possible to assess the overall impact of undulate ray catches on the stock or the relative impacts of the vessels with permits to land undulate ray compared to the impacts of other vessels that catch undulate ray.

Overall, STECF notes that the reports presented by Portuguese authorities to STECF contains limited information on the methodology and the results of the UNDULATA project and that it would have been preferable to have the final UNDULATA project report in order to evaluate the full details of the monitoring program.

STECF acknowledges the assistance of scientists from IPMA and other Portuguese scientists from the University of Algarve for the information they provided by email, in addition to the report.

In conclusion, while the monitoring plan undertaken by IPMA in 2016 has collected useful data which provide preliminary information on the spatial and Bathymetric distribution of undulate ray in area IX, the data and information provided in the monitoring report is insufficient to assess stock status.

ToR 2: Assess if the updated management, scientific data and analyses are sufficient to review and amend the current TAC for undulate ray in area 9.

In addition to the information provided in the 2016 Portuguese Monitoring report, advice on undulate ray in subarea 9 is provided by ICES. The 2017 advice from ICES is as follows:

"ICES cannot provide catch advice on the status of this stock because of lack of reliable survey and catch data. ICES advises that when the precautionary approach is applied, there should be no targeted fisheries on this stock in each of the years 2017 and 2018. Any possible provision for bycatch to be landed should be part of a management plan, including close monitoring of the stock and the fishery".

The most recent advice on a TAC for undulate ray from the STECF is given in its PLEN 15-03 report where it was suggested that 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 become available, e.g. CPUE.

Such advice was referred to in Council Regulation 2016/72 establishing precautionary TACs for undulate ray for both areas 8 and 9, stating that "*Scientific advice received from the STECF indicates that it is in line with the precautionary principle to allow a small by-catch quota for undulate ray (Raja undulata) in ICES subarea IX*".

The STECF also advised *inter alia,* that 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. The 2017 ICES advice "*Any possible provision for bycatch to be landed should be part of a management plan, including close monitoring of the stock and the fishery."* is entirely in line with the STECF advice; however ICES does not defined bycatch fisheries and does not provide quantitative indications on possible bycatch limits.

In addition to the ICES and STECF advices given above, we note that undulate ray is listed as endangered under the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species.

STECF notes that despite the data and information presented in the 2016 Portuguese monitoring report, the data and information currently available in that report and elsewhere is insufficient to provide a reliable assessment of the trends in stock status of undulate ray in Sub-area IX.

Landings of skates have not always been recorded to species level. The ICES WGEF 2017 report indicates that total landings of skates (all species together) from area 9 since 2005 remained stable at about 1800–1200 tons per year, but has decreased since 2014 to 1265 tonnes in 2015 and 1330 tonnes in 2016. (Table 19.2 of that ICES report). Specific data for undulate ray in area 9 are not available for all years, as described in Table 5.3.1 above. The data for 2003-2008 estimated by Maia et al. (2013) would represent around 43.6% of the annual total landings of all elasmobranchs caught by trammel nets in Portuguese waters (Coelho et al., 2005)

STECF notes that no data were provided by Spanish authorities on undulate ray fisheries in the northern parts of area IXa that belong to Spain (southern Galicia). In Spain, R. undulata is caught mainly in the coastal waters of Galicia (northern part of Division 9.a and western part of Division 8.c) where artisanal gillnet fisheries operate in bays, rias and shallow waters (ICES WGEF 2017 report). STECF has identified that Spain reported 192 kg of undulate ray in area 9a in 2015 in the Annual Economic Report data tables.

STECF also notices that length–frequency distributions of *R. undulata were* collected on board polyvalent Portuguese vessels for the period 2008–2013 (ICES WGEF 2017). STECF cannot use these old length frequency figures to evaluate if the minimum and maximum reference sizes established by the Portuguese law in 2016 are respected or not.

In conclusion, STECF has no new objective scientific criteria to change its advice given in its PLEN 15-03 report or to suggest a specific level of TAC for 2018.

ToR 3 Provide an explicit level of total allowable catch for the 2018 Fishing Opportunities for undulate ray in area 9.

Given the STECF response to ToR 2 above, STECF has no objective criteria on which to base a proposal for an explicit level of TAC for undulate ray in ICES subarea 9 for 2018.

ToR 4: Suggest what data collection, studies or monitoring is required to further manage this fishery at sustainable levels

Options for management and associated data needs for the management of skates and rays were investigated by the STECF EWG 17-10 and were reviewed by the STECF in section 4.3 of this plenary report. The STECF considers that such options are equally applicable to the management of undulate ray in ICES area 9.

STECF considers that all data, studies and monitoring required to further manage this fishery at sustainable levels should not only be provided by Portuguese authorities but also by Spanish authorities in the northern part of the ICES IXa area (southern Galician waters)

If management measures established in 2016 for undulate ray in area 9 are to continue, STECF suggests the following information be collected:

a) Regarding the Portuguese self-sampling programme established in 2016, STECF notes that future data collection and monitoring should first attempt to solve the shortcomings detailed in the section "Answer to ToR 1". In particular it would be necessary to collect the following data that were not well addressed in the 2016 report: (i) fishing hauls where the species was caught as well as in those hauls were it was not caught; (ii) length frequencies; (iii) number of trammel nets and particularly the length of the nets deployed; (iv) daily, monthly and importantly, annual catch, (v) sex and maturity stage of the individuals caught.

b) STECF notes that according to the 2017 Annual Economic Report (AER) on the EU Fishing Fleet (STECF 17-12), there were around 3000 vessels in Portuguese small scale fishing fleet in 2015, employing around 8500 employees, or 2923 in FTE (full time equivalent). However, there is no specific information in the AER on the economic dependency of Portuguese small scale fleets on undulate ray. The information available in landings by species, reported by Portuguese authorities during the economic data call, allows to separate 10 different ray species and evaluate the trend in total ray catches landed by small scale fleet (all fleet segments with vessels length <12 m) in area 9 but not for undulate ray, which is assumed to be reported under general code SKA (*Raja* rays nei) (Table 5.3.2). The overall value of *Raja* rays nei landings dropped from 351.3 thousand euro in 2008 to 51.4 thousand euros in 2014 and 20.9 thousand euros in 2015. Given that *R. undulata* represent only a proportion of the total landings of ray

species, the socio-economic importance of undulate ray to the Portuguese small scale fleet is expected to be minor.

Table 5.3.2. Portuguese Small scale fleets landings (vessels <12 m length) in Area 9.

	2008	2009	2010	2011	2012	2013	2014	2015
Landings weight, tonnes								
Total rays (all ray species reported)	***454.6***	***434.8***	***462.6***	***474.1***	***401.5***	***434.6***	***377.3***	***368.6***
Raja rays nei	118.7	90.8	70.0	42.4	28.6	28.8	24.5	9.1
Landings value, 1000 euro								
Total rays (all ray species reported)	***1,280***	***1,151***	***1,113***	***1,180***	***1,082***	***1,026***	***1,005***	***1,000***
Raja rays nei	351.3	250.6	161.8	98.3	75.1	57.0	51.4	20.9

Source: STECF 17-12 - AER - Economic and Transversal data tables.

Although it is known that trammel net account for most skates' landings (ca. 70%), STECF considers that data on longline catches (which represent ca. 18% of undulate ray catches in 2016 in the area according to ICES WGEF report 2017) would also be useful to collect.

Furthermore, and regarding the general management options and data needs stated in EWG 2017-10 for stakes and rays in EU waters, but considering the management measures already in place, STECF notices the following particular needs for undulate ray in area 9:

a) Conservation reference sizes

STECF reiterates that the protection of immature undulate ray is an important element of any management plan. STECF notes that minimum landing size (MLS) can be used to protect juveniles, although it would only be beneficial if it reduces fishing effort on nursery grounds and/or if discard survival is high. STECF considers that the conservation reference sizes established by Portuguese law (*Portaria* nr 96/2016, April 2016: only specimens over 780mm and smaller than 970mm in total length are allowed to be landed) is a step forward to protect juveniles and the spawning stocks. STECF notes, however, that some studies in Portuguese waters have reported values of L50 that are somewhat lower (862-762 mm for females and 736-768 mm for males, depending on the area; Coelho and Erzini, 2006; Serra-Pereira et al. 2015) than the 780 mm limit stated by the Portuguese law.

STECF notes that at least individual length and sex should be collected during the surveys to estimate the reproductive status of individuals, which will make possible to monitor the trends in juveniles and spawners. Because the Portuguese sampling is based on a self-sampling program, in which information has to be collected by fishermen, it is necessary to implement training courses to show fishermen how to gather these data, and for samples to be collected or some level of monitoring of the data collection at sea.

If possible, a number of specimens may be dissected for gonadal visual inspection in the laboratory.

STECF also considers that it is necessary to carry out new studies on the survivability of undulate in order to confirm if discard survival is high as it has been indicated in previous studies: on-board observations in the Portuguese polyvalent fleet indicate high vitality after capture (91% were found with "good" health status; 3% were found in "poor" health status; ICES WGEF 2017). The observations also indicated that soak time, mesh size and fish size influenced survival, with larger specimens tending to have higher survival.

Furthermore, STECF supports the idea that the maximum landing size established by Portuguese law (*Portaria* nr 96/2016, April 2016: only specimens over 780mm and smaller than 970mm in total length are allowed to be landed) is an appropriate precautionary management measure to reduce fishing mortality on larger females, provided that their survival rate is high and that the increase in SSB will contribute to successful recruitment (it must considered that, in general, there is a close relationship between recruitment and parental stock of elasmobranchs; Stevens et al., 2000).

b) Trip limits

STECF reiterates that trip limits could be an appropriate precautionary management measure to deter target fisheries for undulate ray, whilst allowing a proportion of the bycatch to be landed. However, trip limits set as a percentage should not be considered for undulate ray and should take the form of a quantitative limit (kg) per trip. STECF considers that the daily landings established by Portuguese law (*Portaria* nr 96/2016, April 2016; max. 30 Kg live weight per fishing trip), is a positive measure if it provides an incentive to avoid catching undulate ray. Nevertheless, STECF is unable to assess whether a limit of 30kg per trip is sufficient to ensure that undulate ray in subarea IX is exploited sustainable at a rate that will achieve CFP objectives.

c) Seasonal and spatial closures

STECF reiterates that seasonal management is an appropriate precautionary management measure. STECF considers that the seasonal closure established by Portuguese law (*Portaria* nr 96/2016, April 2016; landing prohibition during the months of May, June and July) partially targets the spawning season, when mature females may come into coastal waters to deposit eggs, and therefore is a positive step to safeguard the reproductive cycle of undulate ray. However, STECF notes that because the reproduction of undulate ray in Portuguese waters extends to winter months (Coelho and Erzini, 2006; Moura et al., 2007; Serra-Pereira et al., 2013), an extension of the seasonal ban to these winter months could offer further protection to breeding females and the sustainability of the stock. Furthermore, because eggs are deposited in the bottom, spatial measures to prohibit activities other than fishing, e.g. anchoring, trawling by any SSF gear, sand extraction, etc could be considered.

Although the coastal nature of undulate ray is theoretically conducive to developing spatial management, STECF-15-03 considered that other management measures would be more pragmatic, at least in the short term because there was not at that time (2015) sufficient data to identify appropriate sites and as to how this may impact on the coastal fleet. STECF considers that the 2016 report presented by Portuguese authorities represents a step forward to understand the spatial distribution of the undulate ray

fisheries in Portuguese coastal waters, from which spatial management measures could be implemented in the future. STECF notes that the patchy distribution of the species along with the higher abundances registered in the Southwest region, where the sandy bottom area is more extended than in central region, could be used as valuable information to define potential closed areas. Furthermore, STECF considers that because several studies have reported that the juveniles of undulate ray also occur in estuaries and coastal lagoons, such as the Sado Estuary in Portugal (reviewed by Ellis et al., 2012), those areas could be considered in any spatial management measures.

STECF notes that while spatio-temporal management may be an appropriate precautionary management measure, there continues to be a lack of historic data on the spatial and temporal distribution of catches, which prevents any sound analysis of the appropriate scale or timing of such measure or its potential efficacy. STECF notes that studies the project UNDULATA will continue to provide data to help develop an analytical assessment for undulate ray in Portuguese waters.

The STECF notes that the stated rationale behind the decision to permit 49 licenced vessels to land undulate ray i.e. to "*ensure the continuity of scientific studies and to assess the state of the resource and ensure, in the future, its sustainable exploitation*" is rather weak. If effective sampling and monitoring of catches of undulate ray are put in place, the data needed to provide an assessment of the stock can be obtained without the need for catches to be landed. Furthermore, there is a risk that setting a landings quota will not provide an incentive to avoid catches and may even encourage targeting of undulate ray. In this context, STECF notes that in relation to "scientific whaling", the EC affirmed that "*the EU should remain firm that legislation allowing special permit whaling cannot be used to justify what is primarily commercial whaling*" (COM(2017) 463 final 2017/0215).

ToR "The STECF is also encouraged to look into any additional scientific information for the stocks concerned, if available, to examine whether this alters the perception of the evaluation above"

The additional scientific information for the undulate ray stock in area 9a till 2014 (included) was summarized in section 2.3 of Annex I (Ad hoc request to the STECF) of the STECF-15-03 report. STECF has updated the information for 2015-2016 with two more publications:

Serra-Pereira, K. Erzini and I. Figueiredo (2015). Using biological variables and reproductive strategy of the undulate ray Raja undulata to evaluate productivity and susceptibility to exploitation. Journal of Fish Biology (2015) 86, 1471–1490.

This study shows that the peak of the reproductive season of undulate ray occurred from December to May and that the estimated length at 50% maturity was 86.2 cm and 76.8 cm total length for females and males, respectively. Results support the idea that the species does not only spawn in spring but also in winter times and that the L50 could be slightly lower than previous estimates. Results also reinforce the greater resilience of skates to fishing pressure compared with other elasmobranchs. Skates have high juvenile and adult survival and greater longevity than the average teleost, but have higher fecundities than many other elasmobranch families. Results from this paper also show that the average length of skates caught by commercial vessels is around 70% of maximum theoretical LT, which is slightly smaller than the L50 of females (i.e. 6 cm below the L50) and above the L50 of males. Consequently, it can be concluded that the fisheries are mainly affecting *R. undulata* that may already have contributed to the

population for at least 1 year. Overall, the study concludes that the life-history patterns and demographic parameters of *R. undulata* presented are generally associated with a healthy population. According to the paper, *R. undulata* is locally common in coastal waters and is a relatively productive elasmobranch.

Conant, T. (2015). ENDANGERED SPECIES ACT STATUS REVIEW REPORT: Undulate Ray, Raja undulata. NOAA report.

This review provides an updated revision of the fisheries and biology of undulate ray, and conducts an extinction risk assessment, using a qualitative 4-level ranking scale modified from reference levels commonly used in other ESA status reviews (e.g. http://www.nmfs.noaa.gov/pr/pdfs/statusreviews/rockfish.pdf) to characterize the level of extinction risk. In terms of growth rate/productivity (large, delayed sexual maturity, protracted incubation) and spatial structure/connectivity (high site fidelity, low migration), the review concludes that several of these demographic risks are intrinsic to elasmobranchs and may render the undulate ray more vulnerable to extinction. However, the review recognizes that undulate ray does not appear currently to be responding adversely to threats but, depending on the level of threat, the species may respond in the future. The review admits that data are lacking on diversity and how it may or may not contribute to extinction; thus, the review admits that it is unknown how this characteristic contributes to the risk of extinction. The review states that abundance is unknown and where data exist on trends, some populations appear stable or increasing, while the Tralee Bay and southwestern Ireland population appears to be declining based on recreational fisheries data (albeit fishing effort is unknown). Overall the review concludes that the species is presently at a low risk of extinction, with no information to indicate that this will change in the foreseeable future. This review contributed to NOAA/NMFS (US) conclusion that "*the undulate ray is not currently in danger of extinction throughout all or a significant portion of its respective range and is not likely to become so within the foreseeable future*" (NOAA/NMFS, 2015: Endangered and Threatened Wildlife and Plants: Notice of 12-Month Finding on a Petition to List the Undulate Ray and the Greenback Parrotfish as Threatened or Endangered Under the Endangered Species Act (ESA).

STECF notes that these two recent documents give new insights on the resilience of this species, which seems higher than that of other elasmobranchs, and that the species has a low risk of extinction. Notwithstanding these facts, STECF considers that precaution is needed to manage this species because of its vulnerable life history traits, the lack of assessments and its endangered status (IUCN).

STECF conclusions

ToR 1

While the monitoring plan undertaken by IPMA in 2016 has collected useful data which provide preliminary information on the spatial and bathymetric distribution of undulate ray in area IX, the data and information provided in the monitoring report is insufficient to assess stock status.

In the absence of sufficient data and information on catches (both landings and discards) it is not possible to assess the overall impact of undulate ray catches on the stock, nor the relative impacts of the vessels with permits to land undulate ray compared to the impacts of other vessels that catch undulate ray.

ToR 2

STECF concludes that the updated information on management, scientific data and analyses are not sufficient to review and advise on any amendment to the current level of TAC for undulate ray in area 9.

STECF concludes that despite the data and information presented in the 2016 Portuguese monitoring report, the data and information currently available in that report and elsewhere are insufficient to provide a reliable assessment of the trends in stock status of undulate ray in Subarea IX. Consequently, STECF has no new objective scientific criteria to change its advice given in its PLEN 15-03 report or to suggest a specific level of TAC for 2018.

ToR 3

Given the STECF response to Request 2 above, STECF has no objective criteria on which to base a proposal for a specific level of TAC for undulate ray in ICES Subarea IX for 2018.

ToR 4

STECF notes that future data collection and monitoring should first attempt to solve the following shortcomings: (i) fishing hauls where the species was caught as well as in those hauls where it was not caught; (ii) length frequencies; (iii) number of trammel nets and particularly the length of the nets deployed; (iv) daily, monthly and annual catch (landings and discards), (v) sex and if possible maturity stage of the individuals caught.

STECF considers if the management provisions permitting landings of undulate ray implemented in 2016 are to be continued, the following data should be collected: length and sex of individuals caught, survivability of undulate ray discards, total catch in weight and number and temporal and spatial variability in CPUE.

STECF considers that the special permits to allow undulate ray fishing through the "sentinel programme" should not be used to justify what could primarily be or become a target commercial fishing.

STECF recognizes that recent publications give new insights on the resilience of this species, which seems higher than that of other elasmobranchs, and that the species has a low risk of extinction. Notwithstanding these facts, STECF considers that precaution is needed to manage this species because of its vulnerable life history traits, the lack of assessments and its endangered status (IUCN).

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STECF-15-03 report "Possible by-catch provisions for undulate ray in ICES areas VIIde, VIIIab and IX". Report available online. https://stecf.jrc.ec.europa.eu/reports

EWG 17-10 Long term management of skates and rays

Stevens, J.D., Bonfil, R., Dulvy, N.K., Walker, P.A., 2000. The effects of fishing on sharks, rays, and chimaeras (chondrichthyans), and the implications for marine ecosystems. ICES J. Mar. Sci. 57, 476–494

5.4 Discarded Plaice Survival Model

Background provided by the Commission

The mechanism to gain an exemption from Landing Obligation that is based on a high survival requires robust scientific supporting evidence. UK has sent to the Commission a proposal for a new form of analysis to estimate survival that they have considered to be practical, affordable and sufficiently robust to support future proposed exemptions. The analysis proposes that once a relationship between the health condition of a fish and its chance of survival has been established over a wide range of conditions, it is possible to generate estimates of survival based only on health condition at the point of release.

With this proposal the UK suggests overcoming the issue that the current methods are resource intensive, and provide data that is relevant only to specific sections of the fleet and in certain areas and during particular periods. Because the factors which influence survival are not well understood, it is may not be appropriate to extrapolate beyond the technical and environmental conditions of the experiments. Therefore there is currently a need to conduct many studies, which may not be feasible or affordable to deliver.

Background information is provided on: https://stecf.jrc.ec.europa.eu/plen1703

Request to the STECF

The STECF is requested to review the analysis provided by UK and assess whether the proposed approach is appropriate to estimate survival to provide scientifically robust evidence for future proposed high survival exemptions.

STECF response

Summary of background information provided to STECF

The report (hereafter CEFAS report) drafted by CEFAS in March 2017 has been sent to the Commission by UK as a proposal for a new form of analysis to estimate survival of plaice. The aim of the study was to provide a methodology that would be sufficiently robust to support future proposed exemptions in the framework of the progressive elimination of discards in EU fisheries as foreseen by Regulation (EU) 1380/2013.

The CEFAS report stressed that, although numerous studies have, and are being, undertaken about survival rate in different species-fishery combinations, knowledge on the factors influencing survival is currently not sufficient to extrapolate much beyond the conditions under which direct observations are made. In order to increase the number of survival assessments performed across more fisheries and conditions, cheaper and quicker appraisal methods are thus needed, that would require less comprehensive experimental setups. To address this, the CEFAS report presented a new approach, whereby, once a relationship between health condition on a qualitative scale ('Excellent', 'Good', 'Poor') of the specimens analyzed in the framework of a survival study and survival is established, then a generic model can be used to infer survival levels when health condition of discarded fish is known.

The methodology presented in the CEFAS report estimated the survival rates of plaice given their condition at the point of discard. Data were provided from six CEFAS studies where fish were caught under commercial conditions in different fisheries, their vitality condition assessed and their fate monitored under captivity from 3 to 21 days

(depending on the study). It is not completely clear if the six studies have followed the survivability study standards developed in STECF EWGs on landing obligations (STECF 2014a, b, c) and ICES Report of the Workshop on Methods for Estimating Discard Survival WKMEDS (ICES 2014, 2015, 2016a, b).

A Bayesian hierarchical cure model was developed to model the survival of the fish, considered as the proportion of fish that survive capture and would therefore be assumed to survive being released back to sea. This model assumed that for fish in a particular health condition without considering the age or length, the underlying statistical distribution for the probability of survival is the same for the entire sample. The CEFAS study reported that the mean of the distribution and 95% confidence intervals for each of these conditions were 63% (range 40-81%) survival for plaice in 'Excellent' condition, 33% (range 12-57%) survival for 'Good' and 19% (range 5-43%) survival for 'Poor' respectively, such differences were not statistically tested. These are combined with information on the proportion of fish in each condition in the catch to estimate the overall survival probability of the catch.

STECF observations

Due to the practical difficulties, complexity and high costs of estimating survivability, particularly with regard to the assessment of post-discard mortality; it may not be possible to obtain estimates of overall discard survival for the vast majority of species and fisheries, even for obvious candidate species like plaice.

It is therefore likely that managers will need to take decisions on proposed exemptions based on information that may not be fully reflective of the true survival rate even if it has been obtained under rigorous experimental conditions.

STECF acknowledges thus that the outputs of the study carried out by CEFAS are helpful and could potentially provide a strong statistical background for the analyses of survival rates in several combinations of fisheries and species.

STECF notes however that a number of general issues were identified in the CEFAS report, which may need further investigations. Some of these issues, together with other issues identified by STECF, are detailed below.

1.The proposed approach fits a separate model for each condition rather than fitting one model to all three conditions and allowing the parameters to vary in some manner between conditions. STECF notes that fitting one model to all three conditions together is a more complex problem and would need deeper investigations. One disadvantage of the approach developed in CEFAS report occurs when combining the results to estimate the total proportion of discards in a haul that survive given the proportion in each condition, which may lead to counterintuitive results when the relative proportion of the various conditions vary.

2. One area not investigated by CEFAS report is that the time of death was not known exactly. Instead, fish were checked every 12 hours. Thus, the data are interval censored – which means that death can be identified within a particular interval rather than a specific time. Treating the data in this way again increases the complexity of the modelling. However, STECF notes that accounting for this additional complexity will not have a major impact on the results as long as survival is monitored over several days.

3. The CEFAS report notes that the fitted cure models have modelled survival as a Weibull distribution and the study did not explore other distributions. However, STECF notes that the Weibull distribution is extremely flexible, it has been suitable for other discard studies (Benoît et al, 2015) and visual inspection does not suggest that this distribution is inappropriate.

4. STECF notes that the CEFAS report is based on survival studies considering discard mortality for fish at the point they would be discarded, holding them in captivity and recording their fate for a sufficiently long period. However, as observed by ICES WKMEDS, a method to estimate discard mortality in the natural environment, consists in deploying tags on discarded fish and retrieving those tags to determine the fate of the fish assessing post-discard mortality. Both methods generate robust discard survival estimates, and the main difference between the two methods is that when using tags, the discard estimate includes the effect of predation, which is missing when using captive observation, as in the case of the studies considered in CEFAS report.

5. STECF notes that in the statistical approach developed in the CEFAS study, other important factors (such as fish individual length) were not combined with the health condition ('Excellent', 'Good', 'Poor'), although it has been demonstrated that plaice survival can vary with length (Revill et al., 2013;. van der Reijden et al., 2017)

6. Furthermore, STECF notes that the definition of health conditions may not be completely objective and it is difficult to provide an accurate and precise protocol to define them. Therefore, the use of empiric health condition alone (as used in CEFAS report) and not in combination with any other objective evidence could bias the model outputs. The CEFAS study has incorporated health condition as a random effect in the model, which in principle should account for this subjectivity (Benoît et al., 2010). Nevertheless, other proxies may be less subjective, such as reflex action mortality predictors (RAMP) (Davis, 2010; Davis and Ottmar, 2006; Stoner, 2012), though Uhlmann et al. (2016) also detected some observer effect. The inclusion of reflex impairment data and injury scores would provide semi-quantitative evidence to support more consistency in the health assessments (van der Reijden et al., 2017). More generally, STECF notes that there are a number of other studies also ongoing to estimate survival out of vitality observations rather than through actual survival experiments. For example, a study on plaice survival carried out by Morfin et al. (2017) also estimated the relationship between discard survival and a semi-quantitative index of fish vitality, during a captivity experiment performed in winter in the English fishery, and then subsequently estimated survival by measuring the vitality index in various commercial conditions in three different seasons. The survival rates for plaice were accurately estimated at 62.8% in January-February, 66.6% in November and 45.2% in July. The vitality index varied accurately across the various environmental or fish biological conditions, the time fish spent on the deck, the bottom and air temperatures, the tow depth and the fish length. The authors concluded that such an index could be a good predictor of survival across a broad range of environmental conditions and would represent a cost-efficient survival assessment, but they also noticed that further investigations on the stability of the vitality-survival relationship within a fishery are needed.

Ultimately, STECF underlines that a critical review of survival assessment methods and some meta-analyses of such survival estimates are currently being undertaken by ICES WKMEDS. The meta-analysis provides a quantitative synthesis of the effect size of key explanatory variables from several comparable studies. This is used e.g. to develop methods for projecting non-asymptotic survival estimates to asymptote; and to define quality assessment criteria such as health and vitality indices and weighting methods for estimate variance, control survival and the quality score (see ICES 2016a, section 4.2.3). In the framework of the ICES WKMEDS, synthetic knowledge is thus currently being compiled to support more robust and cost-efficient survival estimation methods considering more factors than the health condition only; the CEFAS report presented here is included in the meta-analysis; however the results are not fully operational yet.

STECF conclusions

In line with the considerations of ICES WKMEDS, STECF concludes that the general principle of the approach is appropriate, but that it cannot yet be used to provide scientifically robust evidence for future proposed high survival exemptions.

Health status of discarded catches can potentially provide an indicator of discard survival, but STECF notes that further methodological developments are still required, in order to e.g. take into consideration important factors such as fish length and to establish generic guidelines to assess fish vitality. Such additional developments might improve the wide ranges of uncertainty associated with the survival rates currently estimated by the approach.

STECF notes that related developments are well in progress within the frame of ICES WKMEDS, which might deliver an objective framework for the robust assessment of survival estimates using several criteria to score vitality status. This framework is expected to be operational with the next year, which would provide an objective standard allowing more rapid and cost-efficient survival assessments across a range of species and fisheries.

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5.5 Fishing effort ceilings allocated in Sole and Plaice fisheries of the North Sea

Background provided by the Commission

In accordance with Article 9 of the Council Regulation (EC) No 676/2007 establishing a multiannual plan for fisheries exploiting stocks of plaice and sole in the North Sea the maximum level of fishing effort available for fleets where either or both plaice and sole comprise an important part of the landings or where substantial discards are made should be adjusted to avoid that planned fishing mortalities rates are exceeded. The Commission has to request STECF advice on the maximum level of fishing effort necessary to take catches of the plaice and sole. When preparing the advice, STECF should take into consideration TAC advice and follow the Regulation (EC) No 676/2007. Similar advice was

Background information is provided on: https://stecf.jrc.ec.europa.eu/plen1703

Request to the STECF

STECF is requested:

- to advise on the maximum level of fishing effort necessary to take catches of the plaice and sole equal to the EU share of the TACs adopted according to the multi-annual plan for plaice and sole in the North Sea (R (EC) No 676/2007);
- to report on the annual level of fishing effort deployed by vessels catching plaice and sole, and to report on the types of fishing gear used in such fisheries.

STECF response

This response is based on the ICES advice of 14th November 2017 and accompanying catch options, and the FDI-classic database hosted by the JRC as of July 2017. However, one value of the BT2 effort for one Member State for 2016 in the FDI-classic database was found to be incorrect during PLEN 17-03. Consequently, the total BT2 effort in the North Sea for 2016 has been corrected and updated to 29 437 '000 kWdays. The corrected value has been used to calculate the 2018 effort ceilings requested. The FDI-classic database has also been updated accordingly. An addendum to the FDI-Classic report will be issued and the corresponding electronic data tables will be updated after STECF Plenary

Maximum level of fishing effort necessary to take catches of the plaice and sole equal to the EU share of the TACs adopted according to the multi-annual plan for plaice and sole in the North Sea (R (EC) No 676/2007)

STECF notes that similar advice has been requested since 2007 (see STECF winter plenary reports 2007-2011, summer plenary reports 2012-2015, and winter plenary again since 2016; STECF review of scientific advice reports 2007-2014). STECF has followed the same approach for the current request.

ICES advice for sole in Subarea 4 - *ICES has advised that when the second stage of the EU management plan (Council Regulation No. 676/2007) is applied, catches in 2018 should be no more than 15 726 tonnes.*

ICES advice for plaice in Subarea 4 and Division 3.a.20. - *ICES advises that when the MSY approach is applied, catches in 2018 should be no more than 142 481 tonnes in Subarea 4 and Subdivision 3.a.20 combined.*

STECF notes that the predicted catches, (following the regulation [R (EC) No 676/2007]) for North Sea sole implies no change in F on sole in 2018 relative to F in 2017, and corresponding to 2% decrease compared to the 2017 TAC for sole.

STECF notes that the predicted catches, (following the regulation [R (EC) No 676/2007]) for North Sea plaice implies an 49% increase in F on plaice in 2018 relative to F in 2017, corresponding to an 33% increase in catches (196 653t in 2018) compared to the agreed 2017 TACs for Subarea 4 and Division 3.a.20 (129 917t and 17 639t respectively). STECF underlines that the ICES advice does not follow the regulation [R (EC) No 676/2007] for plaice, but the MSY approach.

Assuming (as before [STECF review of scientific advice 2007-2014]) a proportional relationship between fishing mortality and effort in kW*days and a constant EU share of the TAC for plaice, if the 2018 TACs for plaice and sole are set in line with the management plan (R (EC) No 676/2007), STECF considers that the best estimate of the maximum level of fishing effort necessary to take catches equal to the EU shares of the TACs, would be equivalent to no change in effort in 2018 relative to 2017 when considering sole in isolation and a 49% increase in effort when considering plaice in isolation.

Plaice is mainly caught together with sole in a mixed beam trawl fishery. Therefore, the **maximum** level of fishing effort necessary to take catches of **both species** equal to the respective EU shares of their TACs, would be equivalent to an increase in effort in 2018 relative to 2017 of 49%. STECF notes that this amount of effort would likely lead to a mismatch between effort and the advised catches of sole according to the flatfish plan [R (EC) No 676/2007], potentially leading to catches of sole above the ICES advice. Assuming the same proportional change in F on sole as that required to take the TAC for plaice, the advised catches of sole would be overshot by 42% (around 6 600 tons).. STECF also notes that according to the flatfish plan [R (EC) No 676/2007] catches of plaice would be potentially above the advised F_{MSY} catches of plaice by 38% (around 54 000 tonnes) (Table 5.5.1. Option 1a,b), due to the F target for plaice (0.3) in the management plan being higher than F_{MSY}.

STECF additional considerations

In addition, STECF has also updated the tables provided in previous years providing more detailed information on specific scenarios for 2018.

i) The 2018 TACs are set in accordance with F_{MSY}
ii) The 2018 TACs are set in accordance with the management plan
iii) The 2018 TACs are set at the level of the 2017 TACs

In each of the above assumptions, the implications for one species assuming the same relative change in F needed to take the TAC for the other species are estimated (Table 5.5.1. Options 3a,b, and 4a,b).

STECF notes that at present the ICES advice for sole is based on "total catch" which includes about 8% "unwanted catch", i.e. the estimated of the total catch that would be discarded if sole were not subject to the landing obligation. For plaice, the ICES advice is also based on the "total catch" which includes about 32% "unwanted catch", i.e. the estimated of the total catch that would be discarded if plaice were not subject to the landing obligation.

Table 5.5.1. provides the predicted catches and associated effort and expresses them relative to those advised by ICES. All effort estimates, assume a proportional relationship with F.

- Options 1 and 2 give an overview of the maximum effort levels needed to take the TACs of sole and plaice in 2018 if the TACs are set 1) according to the provisions of the management plan and 2) according to stock-specific estimates of F_{MSY}.
- Option 3 gives the predicted catches and associated effort for sole and place assuming that effort deployed is determined by 3 alternative management options **for sole** ($F_{2018}=F_{MSY}$; F_{2018}=MP; TAC 2018 = TAC 2017 (Stable TAC)).
- Option 4 gives the predicted catches and associated effort for sole and place assuming that effort deployed is determined by 3 alternative management options **for plaice** ($F_{2018}=F_{MSY}$; F_{2018}=MP; TAC 2018 = TAC 2017 (Stable TAC)).

Table 5.5.1 Predicted catches and associated effort and expresses them relative to the relative changes to those advised by ICES. All effort estimates assume a constant relationship between fishing effort and fishing mortality. Each table in the left (options a) is linked to each table in the right (option b) with "change F" levels. (See STECF observations below).

Advice for 2018	**Sole (MP/FMSY)**	**15726**	**Total Catches (t)**
	Plaice (FMSY)	**142481**	**Total catches (t)**

Option 1a: Predicted catches according the ICES provisions of the MP

Basis	F Total	Change F	Catches	Difference in catches compaired to ICES advice	Rel. difference in catches compaired to ICES advice
	2018	2017-2018	2018	2018	2018
MP-sole	**0.2**	0%	**15726**	0	0%
MP-plaice	0.3	+49%	196653	54172	38%

Option 1b: Predicted catches corresponding to the maximum change in effort equal to take the full potential share of the 2018 TAC for both species

	F Total	Maximum Change F	Catches	Difference in catches compaired to ICES advice	Rel. difference in catches compaired to ICES advice
	2017	2017-2018	2018	2018	2018
Max. effort => Sole	0.298	+49%	22337	6611	42%
Max. effort => Plaice	0.3	+49%	196653	54172	38%

Option 2a: Predicted catches corresponding to fish at FMSY in 2018

Basis	F Total	Change F	Catches	Difference in catches compaired to ICES advice	Rel. difference in catches compaired to ICES advice
	2018	2017-2018	2018	2018	2018
FMSY-sole	**0.2**	0%	**15726**	0	0%
FMSY-plaice	**0.21**	+4%	**142481**	0	0%

Option 2b: Predicted catches corresponding to the maximum change in effort equal to take the full potential share of the 2018 TAC for both species

	F Total	Maximum Change F	Catches	Difference in catches compaired to ICES advice	Rel. difference in catches compaired to ICES advice
	2017	2017-2018	2018	2018	2018
Max. effort => Sole	0.227	+4%	17613	1887	12%
Max. effort => Plaice	0.21	+4%	142481	0	0%

Option 3a: Predicted catches of sole, following different options for F in 2018

Basis	Sole F Total	Change F	Catches	Difference in catches compaired to ICES advice	Rel. difference in catches compaired to ICES advice
	2018	2017-2018	2018	2018	2018
FMSY	**0.2**	0%	**15726**	0	0%
MP	**0.2**	0%	**15726**	0	0%
Stable TAC	0.206	+3%	16123	397	3%

Option 3b: Implications for plaice catches assuming the same relative changes in F as applied to sole

Plaice F Total	Change F	Catches	Difference in catches compaired to ICES advice	Rel. difference in catches compaired to ICES advice
	2017-2018	2018	2018	2018
0.202	0%	137458	-5023	-4%
0.202	0%	137458	-5023	-4%
0.208	+3%	141225	-1256	-1%

Option 4a: Predicted catches of plaice, following different options for F in 2018

Basis	Plaice F Total	Change F	Catches	Difference in catches compaired to ICES advice	Rel. difference in catches compaired to ICES advice
	2018	2017-2018	2018	2018	2018
FMSY	**0.21**	+4%	**142481**	0	0%
MP	0.3	+49%	196653	54172	38%
Stable TAC	0.337	+67%	217551	75070	53%

Option 4b: Implications for sole catches assuming the same relative changes in F as applied to plaice

Sole F Total	Change F	Catches	Difference in catches compaired to ICES advice	Rel. difference in catches compaired to ICES advice
2018	2017-2018	2018	2018	2018
0.227	+4%	17613	1887	12%
0.298	+49%	22337	6611	42%
0.334	+67%	24606	8880	56%

Bold = basis for advice

Note: Plaice is a combined assessment of subarea 4 and subdivision 3.a.20.

STECF notes that the 2018 ICES advice for plaice is based on F_{MSY} (F=0.21; catches = 142 481t) and not on the provisions of the Management Plan (= +15% TAC). The increase of fishing mortality/effort in 2018 (F=0.21) compared to 2017 (F=0.202) is 4% (Table 5.5.1. Option 2 a).

STECF notes that the catches of sole in 2018 when fishing at F_{MSY} (F=0.2; catches = 15726t) are the same as those expected according to the provisions of the management plan and imply no change in F in 2018 (F=0.20) compared to 2017 (Table 5.5.1. Option 2 a).

STECF observations

Management Plan scenario – maximum level

- If the TAC's for sole and plaice in 2018 are set in accordance with the provisions of the Management Plan, the **maximum** level of fishing effort necessary to take catches of **both species** equal to the respective EU shares of their TACs, would be equivalent to a 49% increase in effort in 2018 relative to 2017. Assuming a proportional relationship between fishing mortality and fishing effort, such an increase in effort implies that fishing mortality on sole in 2018 would be F=0.298 and catches of sole are predicted to be 22 337t. Such a level of catch represents an increase of 42% over and above the catches corresponding to the ICES advice for sole for 2018. Similarly, to take the EU share of the TAC for plaice implies that F on plaice in 2018 would be F=0.30, an increase in F on plaice of about 43% compared to the ICES advice (F=0.21). Such an increase in F implies that catches would be 38% above the catches corresponding to fishing at F_{MSY} (Table 5.5.1. Option 1a,b).

F_{MSY} scenario – maximum level

- If the 2018 TACs for sole and plaice are set in accordance with the catches that correspond with their respective F_{MSY}, the **maximum** level of fishing effort necessary to take catches of **both species** equal to the respective EU shares of their TACs, would be equivalent to a 4% increase in effort in 2018 relative to 2017. Assuming a proportional relationship between fishing mortality and fishing effort, such an increase in effort implies that fishing mortality on sole in 2018 would be F=0.227 and catches of sole are predicted to be 17 613t. Such a level of catch represents an increase of 12% above the catches corresponding to the ICES advice for sole for 2018. Similarly, to take the EU share of the TAC for plaice implies that F on plaice in 2018 would be F=0.21, an increase in F on plaice of about 4% compared to F in 2017, but equal to the ICES advice for plaice (F_{MSY}) corresponding to plaice catches of 142 481t (Table 5.5.1. Option 2a,b).

Other Management plan scenarios

- If the 2018 TACs **for sole** is set according to the provisions of the **management plan**, and the TAC for plaice is set according to the relative change in F required to take the sole TAC, catches of plaice in 2018 are predicted to be 137 458t, which represents a 4% decrease on the catches corresponding to ICES advice.
- If the 2018 TACs **for plaice** is set according to the provisions of the **management plan**, and the TAC for sole is set according to the relative change in F required to take the plaice TAC, catches of sole in 2018 are predicted to be 22 337t, which represents a 42% increase on the catches corresponding to ICES advice.

Other F_{MSY} scenarios

- If the TACs for sole and plaice are set according to the relative change in F required to fish at **F_{MSY} for sole**, catches of plaice in 2018 are predicted to be 137 458t, which represents a 4% decrease on the catches corresponding to ICES advice.
- If the TACs for sole and plaice are set according to the relative change in F required to fish at **F_{MSY} for plaice**, catches of sole in 2018 are predicted to be 17 613t, which represents a 12% increase on the catches corresponding to ICES advice.

Constant TACs scenarios

- If the 2018 **TACs for sole** is set at the **level agreed for 2017**, and the TAC for plaice is set according to the relative change in F required to take the sole TAC, catches of plaice in 2018 are predicted to be 141 225t, which represents a 1% decrease on the catches corresponding to ICES advice.
- If the 2018 **TACs for plaice** is set at the **level agreed for 2017**, and the TAC for sole is set according to the relative change in F required to take the plaice TAC, catches of sole in 2018 are predicted to be 24 606t, which represents a 56% increase on the catches corresponding to ICES advice.

Options 3a,b and 4,ab (Table 5.6.1) indicate that the management option that most closely matches the ICES advice for sole and plaice is to set the TAC for sole in accordance with FMSY/MP (15 726t). Doing so implies no change in F on plaice compared to 2017. No change in F on plaice is predicted to result in catches of plaice of 137 458t which represent a 4% decrease below that advised by ICES.

Report on the annual level of fishing effort deployed by vessels catching plaice and sole, and to report on the types of fishing gear used in such fisheries.

The deployed level of effort (kW*days) in the North Sea for the gears catching sole and plaice over the period 2003-2016 are presented in Table 5.5.2 and 5.5.4 and Figure 5.5.1-2 below.
The catches of plaice and sole for the North Sea gears are presented in Table 5.5.3 and Table 5.5.5 respectively.

The meaning of the gear groupings is as follows:

- BT1: beam trawls with mesh size equal to or larger than 120 mm
- BT2: beam trawls with mesh size equal to or larger than 80 mm and less than 120 mm
- GN1: gill nets
- GT1: trammel nets
- LL1: longlines
- TR1: bottom trawl with mesh size equal to or larger than 100 mm
- TR2: bottom trawls with mesh size equal to or larger than 70 mm and less than 100 mm
- TR3: bottom trawls with mesh size equal to or larger than 16 mm and less than 32 mm

- BEAM: beam trawls with mesh size smaller than 80 mm or missing mesh size

- DEM_SEINE: Danish Seine with mesh size equal to or larger than 32 mm and less than 70 mm or missing mesh size
- DREDGE : dredges
- OTTER : otter trawls with mesh size equal to or larger than 32 mm and less than 70 mm or missing mesh size
- PEL_SEINE : pelagic seine (all mesh sizes)
- PEL_TRAWL : pelagic trawl (all mesh sizes)
- POTS: pots
- NONE : unspecified gear type

Table 5.5-2. Effort ('000 kWdays) of the gear catching sole and plaice in the North Sea (2003-2016). Gears presented in order of ranking for 2016 plaice catches.

Gear/Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BT2	60349	59376	58961	50362	48377	36065	36818	36249	31545	27338	29458	27270	26937	29437
TR1	31758	25468	24788	25285	21776	24506	24122	21971	22166	20638	19150	20138	22415	25046
TR2	20285	19656	18214	17164	17425	17498	14861	14245	12515	10586	8250	9044	7387	6732
BT1	5675	4968	4613	5347	3254	2039	1673	1631	1525	2797	3331	3283	2266	3338
BEAM	13801	13426	13172	12933	13809	13400	14058	12534	9038	12562	11554	13159	12478	13751
GT1	1070	1149	1198	2217	1872	1266	824	1001	1191	1174	1281	1443	1379	1351
GN1	3652	3794	3669	3778	2898	3125	2987	3117	3207	2897	2560	2487	2019	1530
NONE	481	488	385	315	315	311	450	412	463	439	538	574	421	453
PEL_TRAWL	18787	19796	15598	13622	11998	7185	7104	7863	9114	13140	14020	17051	17212	18392
TR3	3173	3089	2437	1797	836	929	613	1134	370	886	1316	1000	1835	2034
DREDGE	2979	3388	2615	2182	2614	2302	2618	2229	2532	2731	3659	3721	4139	4580
OTTER	10931	10269	5499	5712	3291	5366	6186	6444	6677	2677	5835	4765	4757	1514
LL1	372	319	374	241	268	678	1052	689	491	401	372	553	754	939
POTS	4322	4399	4143	6130	6334	6480	6707	6411	6618	6631	6796	8121	8787	8688
DEM_SEINE	23	10	23	2	13	5	14	18	0	27	6	0	0	0
PEL_SEINE	1983	2055	1968	1528	1092	947	1239	999	819	662	830	666	794	601

Table 5.5-3. Catches (t) of plaice from the North Sea gears (2003-2016). Gears presented in order of ranking for 2016 plaice catches.

Gear/Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BT2	89931	79436	68444	67029	59427	55363	69515	60128	56633	65140	63184	55960	89953	63874
TR1	7243	7389	6839	11673	7281	12325	13566	14908	18514	23000	24688	22147	27974	28939
TR2	12544	9960	7276	8663	8674	8097	8472	7698	51264	20305	9769	19561	17455	11639
BT1	7115	5455	4989	8340	5279	3335	3438	2988	3945	7875	9665	9193	6170	11580
BEAM	361	139	173	70	104	4	188	163	198	9359	174	216	1470	2688
GT1	685	858	4482	1213	654	395	1230	927	1289	2110	3109	2418	2620	2633
GN1	4409	2821	20655	2730	1124	1109	1346	1668	1585	1024	1110	1200	951	1044
NONE	407	336	852	245	202	134	121	80	135	213	407	468	143	271
PEL_TRAWL	15	5	1	4	0	7	6	8	11	11	23	19	14	104
TR3	21	8	22	23	6	0	1	1	0	6	13	5	12	55
DREDGE	0	5	0	1	1	4	14	15	3	18	2	15	0	25
OTTER	353	32	316	11	22	3	7	227	13	96	1	8	65	13
LL1	1	11	1	1	0	0	1	2	1	1	0	0	0	2
POTS	1	0	0	1	1	0	1	2	1	1	1	1	24	1
DEM_SEINE	0	0	0	5	2	0	2	10	0	9	1	0	0	0
PEL_SEINE	0	0	164	0	0	0	0	0	0	0	0	0	0	0

Table 5.5-4. Effort (‘000 kWdays) of the gear catching sole and plaice in the North Sea (2003-2016). Gears presented in order of ranking for sole catches.

Gear/Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BT2	60349	59376	58961	50362	48377	36065	36818	36249	31545	27338	29458	27270	26937	29437
GN1	3652	3794	3669	3778	2898	3125	2987	3117	3207	2897	2560	2487	2019	1530
GT1	1070	1149	1198	2217	1872	1266	824	1001	1191	1174	1281	1443	1379	1351
BEAM	13801	13426	13172	12933	13809	13400	14058	12534	9038	12562	11554	13159	12478	13751
TR2	20285	19656	18214	17164	17425	17498	14861	14245	12515	10586	8250	9044	7387	6732
BT1	5675	4968	4613	5347	3254	2039	1673	1631	1525	2797	3331	3283	2266	3338
TR1	31758	25468	24788	25285	21776	24506	24122	21971	22166	20638	19150	20138	22415	25046
NONE	481	488	385	315	315	311	450	412	463	439	538	574	421	453
DREDGE	2979	3388	2615	2182	2614	2302	2618	2229	2532	2731	3659	3721	4139	4580
POTS	4322	4399	4143	6130	6334	6480	6707	6411	6618	6631	6796	8121	8787	8688
LL1	372	319	374	241	268	678	1052	689	491	401	372	553	754	939
OTTER	10931	10269	5499	5712	3291	5366	6186	6444	6677	2677	5835	4765	4757	1514
TR3	3173	3089	2437	1797	836	929	613	1134	370	886	1316	1000	1835	2034
PEL_TRAWL	18787	19796	15598	13622	11998	7185	7104	7863	9114	13140	14020	17051	17212	18392
DEM_SEINE	23	10	23	2	13	5	14	18	0	27	6	0	0	0
PEL_SEINE	1983	2055	1968	1528	1092	947	1239	999	819	662	830	666	794	601

Table 5.5-5. Catches (t) of sole from the North Sea gears (2003-2016). Gears presented in order of ranking for 2016 sole catches.

Gear/Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BT2	17864	19084	15712	12248	14096	12654	13828	12481	10273	11524	13086	11898	12454	11920
GN1	774	902	1000	846	728	935	992	862	767	909	946	700	466	469
GT1	714	701	786	704	563	814	956	586	640	698	654	739	628	466
BEAM	1791	40	30	18	59	11	20	49	17	603	13828	194	738	445
TR2	297	272	222	249	365	528	460	368	419	303	279	285	403	280
BT1	108	78	42	62	32	30	25	14	15	22	29	74	107	251
TR1	25	20	14	18	25	46	43	30	29	34	44	36	49	214
NONE	58	59	37	19	19	28	26	12	9	5	5	147	5	19
DREDGE	0	0	0	0	0	1	1	1	6	14	1	11	0	2
POTS	10	0	0	0	0	0	1	3	3	1	3	2	4	2
LL1	1	1	1	0	0	0	1	6	0	0	0	1	1	0
OTTER	90	49	46	33	0	0	1	0	2	0	0	0	0	0
TR3	0	0	0	0	0	0	0	0	0	0	0	1	0	0
PEL_TRAWL	2	0	0	0	0	0	0	0	0	0	0	1	0	0
DEM_SEINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEL_SEINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0

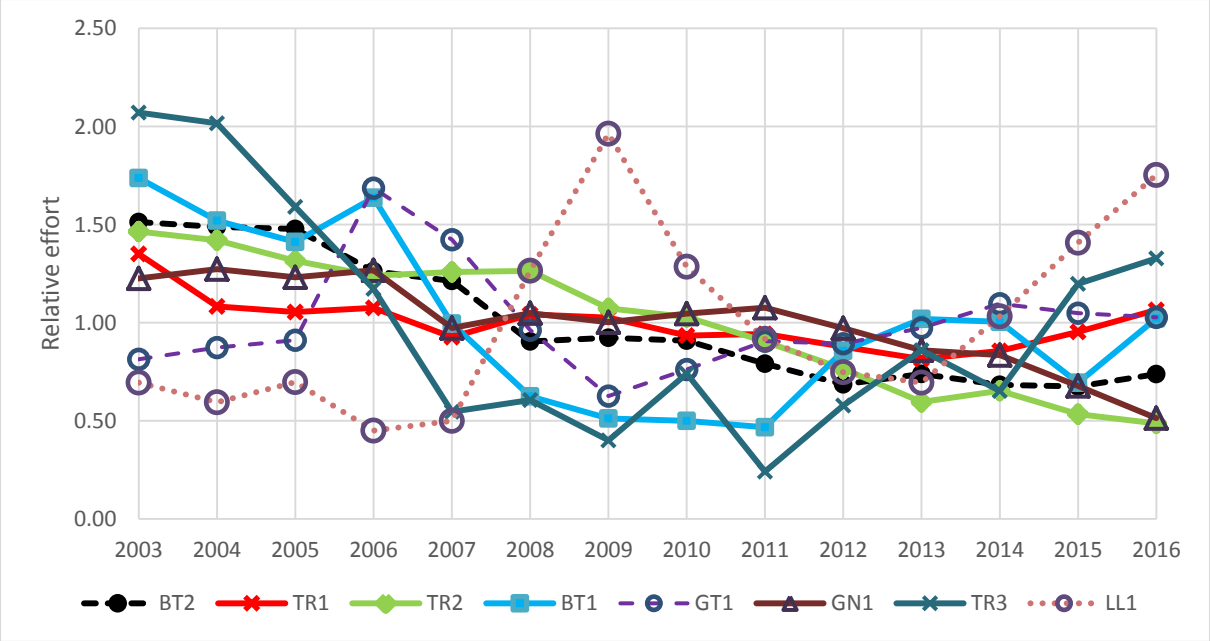

Figure 5.5.1. Trends in effort for the regulated gear (cod-MP) in the North Sea (2003-2016) catching sole and plaice. Each line is relative to the average of the time series.

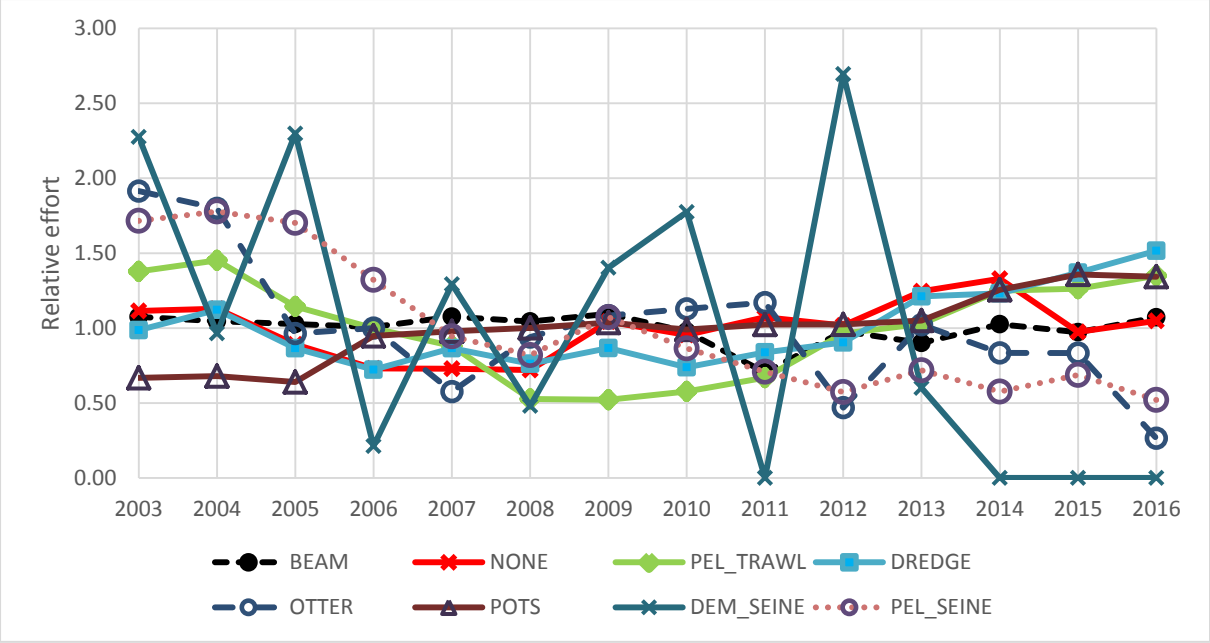

Figure 5.5.2. Trends in effort for the non-regulated gear (cod-MP) in the North Sea (2003-2016) catching sole and plaice. Each line is relative to the average of the time series.

STECF conclusions

Options 3a,b and 4,ab (Table 5.6.1) indicate that the management option that most closely matches the ICES advice for sole and plaice is to set the TAC for sole in accordance with F_{MSY}/MP (15,726t). Doing so implies no change in F on plaice compared to 2017. No change in F on plaice is predicted to result in catches of plaice of 137,458t which represent a 4% decrease below that advised by ICES.

STECF notes that there is a new Management Plan foreseen for 2018 which is unlikely to prescribe any effort ceilings.

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5.6 Derogation for 'gangui' trawlers in certain territorial waters of France. Assessment of additional information submitted by France

Background provided by the Commission

In accordance with Article 13(1) of Regulation (EC) No 1967/2006 (hereafter the MedReg) the use of towed gears is prohibited within 3 nautical miles (nm) of the coast or within the 50m isobath where that depth is reached at a shorter distance from the coast. In addition, Article 13(2) prohibits the use of trawl nets within 1,5 nm of the coast. At a request of a Member State, derogation from Article 13 (1) and (2) may be granted, provided that the conditions set in Article 13(5) and (9) are fulfilled.

Furthermore, Article 4(1) of MedReg prohibits fishing with trawl nets, dredges, purse seines, boat seines, shore seines or similar nets above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams. Derogation from this article may be granted, provided that the conditions stipulated in Article 4(5) are fulfilled. If a fishery benefits from derogation under Article 4(5) then derogation to the minimum distance from the coast and depth shall be allowed.

Finally, a general condition for all derogations is that the fishing activities concerned are regulated by a management plan provided for under Article 19 of the MedReg. According to paragraph 5 of Article 19, the measures to be included in the management plan shall be proportionate to the objectives, the targets and the expected time frame and shall have regard to:

a) the conservation status of the stock or stocks;

b) the biological characteristics of the stock or stocks;

c) the characteristics of the fisheries in which the stocks are caught;

d) the economic impact of the measures on the fisheries concerned.

On 2 June 2014 Commission Implementing Regulation (EU) 586/2014 granted derogation from Articles 4(1), 13(1) and 13(2) of the MedReg in territorial waters of France adjacent to the coast of the Province-Alpes-Cote d'Azur region to 'gangui' trawlers. This derogation applies until 6 June 2017.

In line with the above Commission Implementing Regulation granting derogations, France committed to communicate to the Commission, within 3 years following the entry into force of this Regulation (i.e. until 6 June 2017), a report drawn up in accordance with the monitoring plan established in the management plan. The Management plan for professional 'gangui' fishing in the Mediterranean Sea by vessels flying the French flag was adopted on 13/05/2014.

On 16 June 2017 France submitted a request to prolong the derogation from the first subparagraph of Article 4(1), from the first subparagraph of Article 13(1) and from Article 13(2) of the MedReg for 3 more years. The request was supported with the following documents: the implementation report justifying the request to renew the double derogation, 30 annexes providing supporting data and information, the list of annexes and the list of bibliography. The request was based on the valid management plan, adopted on 13/05/2017 (*Arrêté du 13/05/2014 portant adoption de plans de gestion pour les activités de pêche professionnelle a la senne tournante coulissante, a la drague, a la senne de plage et au gangui en mer Méditerranée par les navires battant pavillon français. (NOR: DEVM, JO no. 122 du 27 mai 2014*).

The above request was evaluated by STECF in its 55th plenary session of 10-14 July 2017. The plenary meeting report concluded that the evidence provided by France did not prove that all conditions required under the Mediterranean Regulation were met. Particular concern was raised regarding the conditions needed to allow fishing above the *Posidonia* beds. On 26 October 2017 French authorities submitted new information and explanations, aiming to answer the reservations and questions raised by the STECF in the last 55th plenary report. Key conclusions can be found in the Annex.

Background information is provided on: https://stecf.jrc.ec.europa.eu/plen1703

Request to the STECF

Based on the additional information and explanations provided by the French authorities which complement the French request for the derogation submitted on 16 June 2017, the STECF is requested to advice and comment as adequate whether the key issues raised by the STECF in its 55th plenary report (section 5.7) are properly addressed.

Key issues addressed by the STECF were:

1. ***MedReg condition under points (ii) and (iii) of the first subparagraph of Article 4(5): fishing activities concerned affect not more than 33 % of the area covered by seagrass beds of Posidonia oceanica within the area covered by the management plan and 10 % of seagrass beds in the territorial waters of France.***

STECF analysis and conclusions:

Although 'gangui' implementation report states that these ratios are lower than the maximum limits of 33 % and 10 %, i.e. 16.2% and 5.8% accordingly, STECF notes inconsistencies in the calculations. Firstly, by using the same values of the Implementation Report, the overall swept area by small ganguis should have been 13.89 km2 and not 10 km2, resulting in 17.4 % of the area covered by seagrass Posidonia beds within the area covered by the management plan and 6.2 % of the total Posidonia beds in French territorial waters and not 16.2 % and 5.8 %, respectively.

Furthermore, STECF notes that for the ganguis with otterboards, the overall footprint (surface area of the seafloor swept by the gear) was underestimated because it is mainly affected by the otterboards, bridles and sweeps, and not only by the groundrope. Therefore, instead of using 10m (horizontal gangui opening at the wing tips), a value corresponding to the otterboard spread should have been used. If not available directly, this value can be estimated using published values from the scientific literature. STECF notes that according to the literature, a value of 20 m likely represents the otterboards spread for such towed gears.

On the other hand, the value of 10 m for the horizontal opening of the small ganguis appears to have been overestimated, since according to the Ministerial Decree of 16 May 2011, which lays down technical measures for the professional gangui fishing in the Mediterranean, the maximum horizontal gear opening must be restricted to 1.5 m. STECF is unable to assess if this technical measure was not respected during the last period of derogation, or it was mistakenly used for the calculation of the swept area in the Implementation Report. STECF however notes that the Ministerial Decree of 16 May 2011 sets a maximum allowed length of 10 m for the small gangui trawls, and thus considers that in the Implementation Report the length of the trawl was

mistakenly confused with the width of the trawl. Therefore, it was decided to revise the calculation by using a mean width of 1.5 m for the small ganguis.

Moreover, according to the Report of the SGMED Subgroup on the Mediterranean Sea, (STECF, 2004), as well as the Ministerial Decree of 16 May 2011, gangui towing speeds range between 1.5 and 3.0 kn depending on the seabed characteristics. Therefore STECF considers that an average value of 2 kn might have been adopted for the calculation.

Following the above considerations, STECF estimated that the calculation of the overall swept area would have resulted in 170.80 km2, which corresponds to ***53.4 %*** *of Posidonia beds surface area in the three departments of Région Provence-Alpes-Côted'Azur, or* ***19.1 %*** *of the total Posidonia beds in French waters. This is above the respective thresholds of 33 % and 10 %, and therefore, the condition of the derogation is not fulfilled.*

2. MedReg condition under Article 13(9): catches of species subject to minimum conservation size as mentioned in Annex III are minimal.

STECF analysis and conclusions:

The gangui implementation report provides with the evolution from 2014 to 2016 of the catch of the species listed in the Annex III of the MedReg in weight and in percentage of the total annual gangui catches. STECF however notes unusual trends in the annual catch composition, for example some species were reported only in some years and are completely absent in others. Furthermore, substantial differences are noted between the total catch of Annex III species by ganguis in 2015 (149.06 kg) and those reported in 2014 (648 kg) and 2016 (2273 kg). According to the information provided, catches of Annex III species represented up to 7 % of the total gangui catches in 2016. Finally, no information has been provided in the Implementation Report about the length frequencies of the species caught annually by the ganguis. To conclude, STECF considers that the data and information presented in the Implementation Report is insufficient and too inconsistent across years, to conclude whether the gangui catches of the Annex III species can be expected to be minimal. Similarly, the selectivity of the gangui cannot be assessed.

3. MedReg condition under Article 13(9)(d): fishing activities do not target cephalopods.

STECF analysis and conclusions:

The annual catches of cephalopods range between ca. 8-10 % of the total catch. STECF notes that even though the Implementation Report states that cephalopods are not in the list of the target species, the reported catch values cannot be indeed considered negligible, therefore the condition requested in the Article 13(9)(d) is not supported by the data provided in the Report.

4. MedReg condition under Article 9: the mesh size comply with the requirement of at least a square-meshed net of 40 mm or a diamond meshed net of 50 mm and panels of netting smaller than 40 mm mesh size are not used for fishing or kept on board.

STECF analysis and conclusions:

Mesh size information is not provided. Only a survey of 2010 carried out by IFREMER is available, but does not provide with needed data.

5. MedReg condition under Article 4(6): appropriate steps have been undertaken to ensure the collection of scientific information with a view to the identification and mapping of Posidonia habitat.

STECF analysis and conclusions:

According to the Report, the impact of bottom fishing gears has remained stable between the two periods and it was evident that the main threats for Posidonia beds comes from other anthropogenic factors. In terms of direct impact on Posidonia beds (grubbing up) the most tangible threat comes from anchorages from yachting. The Report also shows that Posidonia beds are monitored, evaluated and protected by the Natura 2000 status of the areas in which they are to be integrated. STECF notes that the available habitat maps have not been updated after the implementation of the guangui derogation. In conclusion, while some information does exist on the identification and mapping of Posidonia habitats, no analysis can be made on the recent trends in conservation of the Posidonia beds.

6. Assessing whether the impact on the Posidonia beds has been mitigated further, in the years of implementation of the management plan, in particular ensuring an effective reduction of the fishing capacity and effort.

STECF analysis and conclusions:

The Implementation Report states that: "gangui fishing has no significant impact on the state of marine plant and in particular Posidonia beds on which gangui fishing effort", also in comparison with other anthropogenic impacts. Nevertheless, according to the available literature, gangui trawls are more weighted than other traditional bottom trawls of the same size, and thus they have a higher physical impact on the seabed, in particular the gangui with otterboards. Therefore, it cannot be stated that the impact is insignificant. STECF notes that in the MP no clear distinction was made between small gangui and gangui with otterboards.

Furthermore, no mitigation measures have been described beyond reductions in fishing effort. As for the reduction of the fishing effort, although the number of vessels and the capacity were reduced by 33% (not 36% as stated in the report) and 35% respectively, STECF notes that these estimates are not fully consistent with the values used in the estimation of the Total Swept Area, which estimated a maximum value of 150 fishing days per year for the gangui with otterboards and 50 days per vessels for the small gangui. The actual fishing effort remains thus uncertain.

In conclusion, the overall impact may have reduced mainly through the reduction of the number of gangui vessels with otterboards vessels, but the actual reduction remains unclear and STECF cannot conclude whether this can be considered a sufficient reduction of impact. A more thorough analysis could be performed using e.g. the Total Swept Area approach above, with a detailed documentation on the actual effort deployed by each individual vessel in each year, in order to quantify the actual reduction.

Regarding alternative mitigation measures, STECF notes that alternative gears (e.g. static gears) suitable for targeting the same species may have a potentially lower impact on benthic communities in general and Posidonia beds in particular since such gears are lighter, and have a more limited spatial footprint, especially in comparison with the gangui groundrope and otterboards used by the largest gangui.

7. Assessing whether the current management plan would continue to ensure a sustainable exploitation of species targeted by 'gangui' trawler without jeopardising the socio-economic sustainability of the overall fishing fleets involved in exploiting those resources in the coastal area.

STECF analysis and conclusions:

The management plan was enforced in 2014-2016, but the monitoring of fishing activities using logbooks that include information of each daily trip was not implemented. Sampling of species composition and sizes of catches also appears to not have been done regularly.

STECF notes that basic information on the exploited species has not been provided. As noted above, detailed information of catch by target species and corresponding exploited sizes is unknown. The information has in addition not been provided by gangui type (small gangui vs large gangui with otterboards), despite the fact that gear characteristics and sizes affect catch composition and catch efficiency. Also catch comparison within and outside 1.5 nm has not been performed.

The lack of information does not permit to state that those values refer to the whole gangui fleet (i.e. inside and outside 1.5 nm). It is therefore not possible to know the current status of the target species and trends in CPUE during the implementation of the plan. It can thus not be assessed whether the current stock status is different from that at the beginning of the MP implementation. To conclude, it cannot be assessed whether the plan had or would continue to ensure a sustainable exploitation of the species targeted by gangui.

As for the socio-economic sustainability, although it is stated that gangui fishery does not interfere with the activities of vessels using gears other than ganguis, STECF was not in a position to evaluate this statement. It also remains unclear whether the gangui activity could be sustainably performed outside the prohibited areas.

STECF response

The request to prolong the derogation from the first subparagraph of Article 4(1), from the first subparagraph of Article 13(1) and from Article 13(2) of the MedReg for 3 more years was submitted by France in June 2017 and evaluated by STECF in its 55th plenary session of 10-14 July 2017 (PLEN 17-02). The initial request was supported with the implementation report justifying the request to renew the double derogation, along with other documents, while the new document named "Complementary information regarding the French request for a renewal of derogations related to the Gangui fisheries" was submitted by French authorities during October 2017 in order to provide new information and explanations, aiming to answer the reservations and questions raised by the STECF in the last 55th plenary report.

The STECF observations are listed below under each of the elements of the request.

1. **MedReg condition under points (ii) and (iii) of the first subparagraph of Article 4(5): fishing activities concerned affect not more than 33 % of**

the area covered by seagrass beds of *Posidonia* oceanica within the area covered by the management plan and 10 % of seagrass beds in the territorial waters of France.

The STECF has indicated in its previous assessment during the PLEN17-02 that the horizontal opening of the grand Gangui is rather 20 m than 10 m, so this value was used for the new calculations. Also, new value of 2 knots (1.03 m/s) for average towing speed was also used according to STECF recommendation.

However, new calculations presented by France have used a significantly lower number of fishing days per year for gangui with otterboards, decreasing from 150 (data used in June) to 43 and 38, for 2016 and 2017 respectively. That decrease is based on the average number of days-at-sea considering the real activity recorded in 2016, and the average number of days at sea is based on the average of years 2014 - 2015 – 2016. Similar decreased values were used for calculation regarding small gangui, where the number of fishing days per year was also decreased from 50 to 13 and 21, for 2016 and 2017 respectively. Such new approach to calculation resulted in a lower theoretical maximum impacted surface of *Posidonia* beds in 2017 of 48.4 km^2 (15% of the total area covered by seagrass beds within the management plan area) compared to the estimates initially provided in June (corrected by STECF PLEN 17-02 to be 55.6 km2, i.e. 17.4% of the surface total area covered by *Posidonia* beds), and much lower than the value re-estimated by STECF PLEN 17-02 (170.8 km2, 53.4% of the surface).

STECF raised serious concerns regarding the very large differences between the observed and authorized effort per vessel, which obviously contributes to decreasing significantly the expected surface impacted below the legal threshold. STECF observes that the recorded activity is around 25-30% of the authorized number of fishing days, and means that the gangui fleet operates around 5- 10% of all days in a year. This is very low compared with equivalent small scale fisheries in the NorthWestern /Central Mediterranean (with estimations around 90-130 fishing days per year), and seems also little compatible with the statements regarding the local socio-economic importance of that fleet. STECF considers that these low numbers should have been discussed in the document provided by France, considering that there is no indication that the gangui fishery is seasonal. Additional information on the other activities practiced by the fishers the rest of the year could have been provided in order to demonstrate the full reliability of these activity records and justify the use of these low values in the estimation of the surface impacted.

Additionally, STECF considers that the maximum theoretical impact should be calculated on the basis of the maximum theoretical effort, i.e. the maximum theoretical number of fishing days and the maximum theoretical number of vessels allowed by the management plan. STECF notes furthermore that the official number of days authorized is actually not 150 days but 200 days for the large gangui according to the French legislation (decree of 13 May 2014 sets in Article 4 and Annex II, 3, Chapter 2; page 4 of document "RAPPORT GANGUI_EN.docx" submitted to 17-02 plenary). Using this official value instead of the value of 150 days used in the initial calculations would lead to an even higher estimated area impacted, at 77% of the *Posidonia* area in 2017, much above the 33% threshold.

In consequence, STECF still concludes that the management plan is not in line with the derogation stated in the MEDREG. STECF considers that the French legislation should be aligned with the conditions of the derogation through a drastic reduction of the maximum fishing effort authorised.

STECF notes also that the June calculations were based on assuming 12 large gangui in 2017, against 13 in the present document.

Finally, STECF recalls that the surface of the *Posidonia* beds used in the calculation is potentially outdated, being based on an estimate from 2010. Considering the general declining status of *Posidonia* beds in Mediterranean, it is probable that the current surface in the management area is lower than the 320 km2 value used. It would have been desirable to update this estimate when requiring an extension of the derogation. Maps of fishing effort distributions would also have been useful.

MedReg condition under Article 13(9): catches of species subject to minimum conservation size as mentioned in Annex III are minimal.

Additional information provided by France addressing this TOR are focused on arguing that the observed rate of catches of Annex III species of 7.1% cannot be considered as a target rate in this context. France underline that the total catches of Annex III species in its initial request amount to 2273 kg, and that considering the number of days-at-sea and the number of active-vessels, this leads to an average catch of 3kg per day per vessel, which, according to France, is compatible with the condition of "minimal" catches.

Incidentally, STECF notes that a total catches of annex III at 2 273kg for the actual level of effort in 2016 corresponds to 5.2 kg per vessel per day, not 3 as stated in the document (2273/((9*43)+(4*13))=5.2 kg/day/vessel.

STECF acknowledges that "minimal" has not been clearly defined in the MEDREG. France interprets this condition of minimality as being equivalent to "not targeted". In the absence of clear guidelines, STECF cannot comment further on the scientific validity of this interpretation, but STECF notes also that conversely, no evidence is provided to demonstrate that actions are undertaken to reduce these bycatches over time. Rather, recorded catches of annex III were much higher in 2016 (2273 kg) than in 2014 (648 kg) and 2015 (149 kg) (Table 5.7.3 in PLEN 17-02). Total catches in 2016 were also 2-3 times higher than in 2014 and 2016, which does not point towards a gradual reduction of the gangui fishery.

STECF notes furthermore that no information has been provided to address the other concerns raised in PLEN 17-02 regarding the inconsistencies and gaps in the data provided. Therefore, STECF consider that it is still does not in a position to assess whether catches of species in gangui fisheries are consistent with the MEDREG condition Article 13(9).

3. MedReg condition under Article 13(9)(d): fishing activities do not target cephalopods.

Within the new document France argue that the rate of 8-10% of cephalopods catches does not constitute a target rate. Hence, the new document states that an average catch of cephalopods per day per vessel is 3.5 kg, which means, given the very small size of the fleet, that total catches of cephalopods by the gangui fleet in 2016 represent only 0.13% of the total catches of cephalopods in the Mediterranean GSA7 (2,567 kg by the gangui fleet out of 1972,3 tons in total).

Incidentally, STECF notes that a total catches of cephalopods at 2567 kg for the actual level of effort in 2016 corresponds to 5.8 kg per vessel per day, not 3.5 as stated in the document (2567/((9*43)+(4*13))=5.8 kg/day/vessel.

As for Annex III species, STECF notes that the recorded catches of cephalopods have increased in 2016 (2567 kg) compared to 2014 (1230 kg) and 2015 (1070 kg) (Table 5.7.4 in PLEN 17-02)

A catch ratio of 8-10% cannot be considered negligible; nevertheless, STECF acknowledges that the catches from that fishery may represent only a minor part of the total cephalopods catches in the area.

4. MedReg condition under Article 9: the mesh size comply with the requirement of at least a square-meshed net of 40 mm or a diamond meshed net of 50 mm and panels of netting smaller than 40 mm mesh size are not used for fishing or kept on board.

The new document does not provide any new data and information related to this TOR. Some pictures have been provided, but they do not allow assessing with certainty whether the mesh size used comply with the requirements. Thus STECF remains with its previous conclusion that compliance with the mesh size requirement can not be assessed.

5. MedReg condition under Article 4(6): appropriate steps have been undertaken to ensure the collection of scientific information with a view to the identification and mapping of *Posidonia* habitat.

The new document does not provide any new data and information related to this TOR, thus STECF remains with its previous conclusion.

6. Assessing whether the impact on the *Posidonia* beds has been mitigated further, in the years of implementation of the management plan, in particular ensuring an effective reduction of the fishing capacity and effort.

The new document does not provide any new data and information related to this TOR, thus STECF remains with its previous conclusion.

7. Assessing whether the current management plan would continue to ensure a sustainable exploitation of species targeted by 'gangui' trawler without jeopardising the socio-economic sustainability of the overall fishing fleets involved in exploiting those resources in the coastal area.

The new document does not provide and new data and information related to this TOR, thus STECF remains with its previous conclusion. As noted above, STECF raises some questions regarding the low level of activity of this fleet. These low values make it difficult to assess the actual socio-economic importance of this fleet in the local communities.

STECF conclusions

STECF has evaluated the new information provided to France, and has raised some concerns on a number of inconsistencies between the data and arguments presented in the initial and new document. STECF still concludes that not all conditions seem to be fulfilled in order for a derogation to be granted. The basis for calculation of the theoretical area covered by seagrass beds of *Posidonia oceanica* that could be impacted by fishing activities of ganguis has changed. STECF considers that the maximum theoretical impact should be calculated on the basis of the maximum theoretical effort, i.e. the maximum number of fishing days and maximum number of fishing vessels allowed by the management plan. STECF concludes that the French management plan should be aligned with the provisions of the derogation and the maximum effort authorised should be reduced.

Also, STECF considers that an updated estimate of the current surface of the *Posidonia* beds in the area covered by the management plan would be necessary to objectively assess the current conditions of the derogation.

Other conclusions raised in July 2017 regarding the absence of information on discards, selectivity and length frequencies still apply. STECF also notes that the new document does not provide any new data about mesh size data as well new information that could explain insufficiency and high inconsistency of catches data across years. No new information has been provided demonstrating that the plan can guarantee the

sustainable exploitation of the species targeted by gangui. Rather, STECF notes that catches have increased in 2016 compared to 2014 and 2015, which indicates that the gradual reduction in the impact of this fleet has not occurred.

It remains unclear how the management plan will ensure the preservation of marine ecosystems during future period of gangui activities, whose exact time of termination is unknown.

STECF concludes also that the actual socio-economic impact of the derogation remains unclear. In particular, STECF notes that the recorded number of fishing days operated is very low, so the actual socio-economic sustainability of the fleet and its dependency on the gangui activity remain unclear.

5.7 Adriatic anchovy and sardines

Background provided by the Commission

The EC has launched the proposal for a EU MAP on the Adriatic small pelagic stocks. In the MAP ANNEX I and II there are respectively the target fishing mortality F_{MSY} ranges and conservation reference point (MSY $B_{trigger}$ and B_{lim}, B_{PA}) for sardines and anchovies. These values were derived from STECF 15-14 (2015a) and are now outdated by revised input data and consequent new assessments. Additionally the framework for proposing a target fishing mortality has change from an F_{MSY} computed in eqSIM, to a Patterson Exploitation rate = 0.4 (see STECF Plenary Report July 2017).

The MAP proposal is currently in discussion with the European parliament and the Council.

EWG 17-09

The assessment results from EWG 17-09 show for sardine (Figure 5.7.1) a low level of SSB since 2004 but without any recent further decline and a slightly increasing recruitment in recent years. The fishing mortality remains very high but in the last 2-3 years may have started to decline.

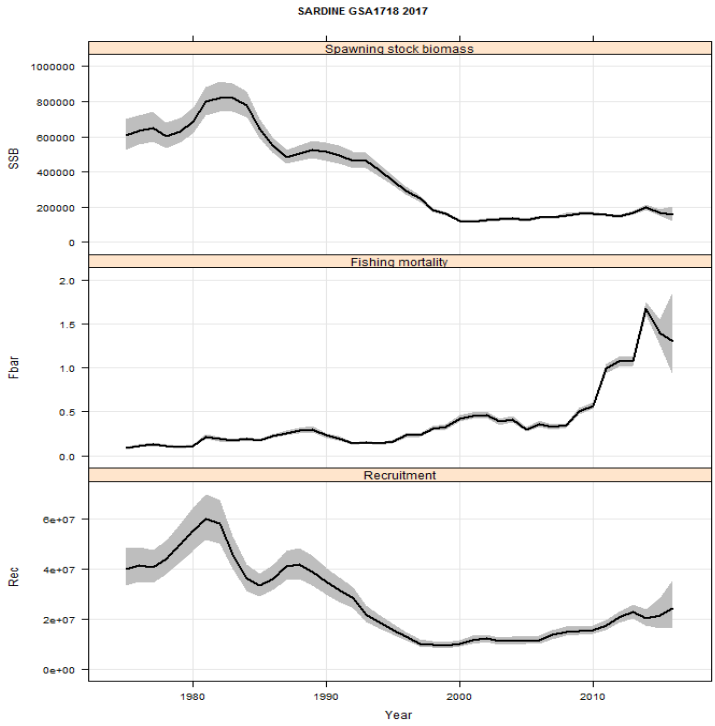


Figure 5.7.1. Provisional Stock assessment for Sardine in GSA 17-18.

For anchovy (Figure 5.7.2) the trends of both spawning stock biomass and recruitment have declined since 2004 and are now close to the historical lowest points

in the series. Fishing mortality has been high (>1) since 2009 and is estimated to be the highest on record.

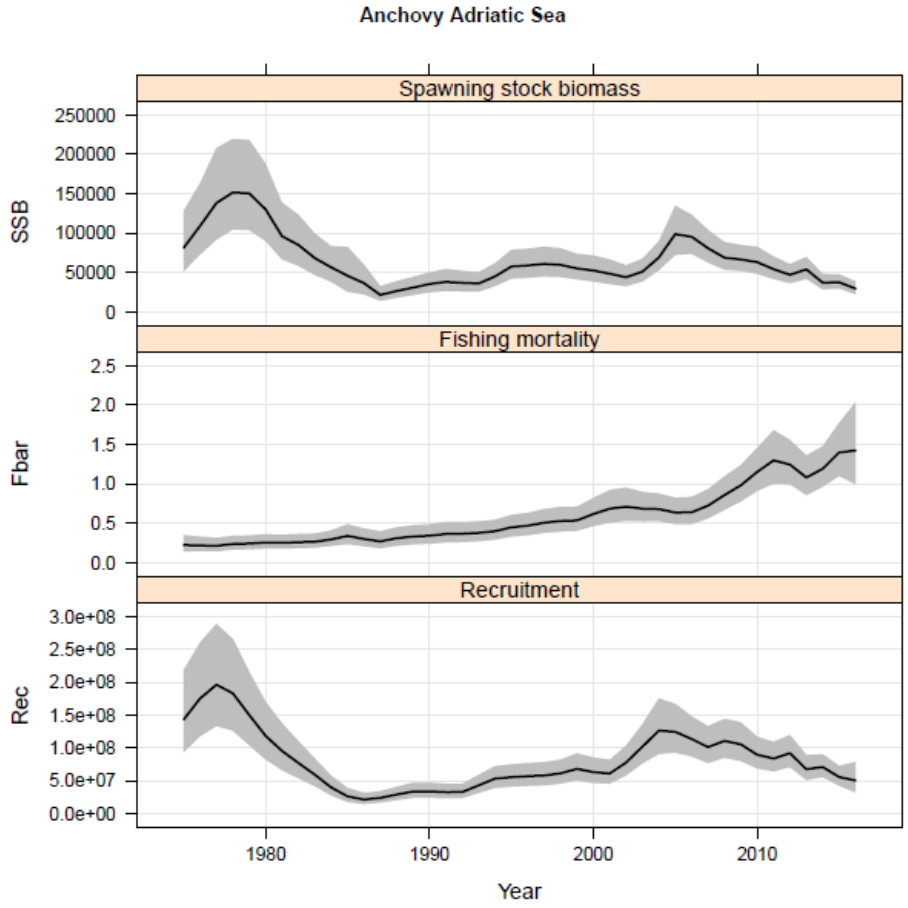


Figure 5.7.2. Provisional Anchovy GSA 17-18 stock assessment.

For reference points, EWG 17-09 indicated, in line with the advice of STECF PLEN 17-01, that the most reliable precautionary reference point is the Patterson Exploitation rate E = 0.4 as it does not have to rely on a stock recruitment relationship (S/R) as other reference points related to MSY, unlike the recent GFCM reference points which rely on assumptions on the S-R not supported by the data (See STECF Plenary July 2017 for discussion of these issues).

EWG 17-09 proposed the following proxy F_{MSY} values on the basis of Patterson Exploitation rate:

Sardine F_{MSY} = 0.44
Anchovy F_{MSY} = 0.57

For the sake of understanding how these compare to prior reference points proposed by STECF and GFCM a summary is produced in Table 5.7.1.

Table 5.7.1. Comparative table of reference point calculation results for Adriatic sardine and anchovy stocks from STECF and GFCM, EqSim results depend on the assumed SSB break points. Reference points based on E=0.4 depend on M and selection in the fishery.

Meeting	Assessment method	M	F_{curr}	F_{MSY}	M/F_{MSY}	F/F_{MSY}	Method	SSB (t) at breakpoint
Sardine								
STECF 15-14 (2015a)	SAM	0.6	1.1	0.08	7.5	13.75	EqSim	446000
GFCM 2015b	SAM	0.6	1.087	0.71	0.85	1.53	EqSim	250000
STECF 16-22 (2016c)	SAM	0.6	1.95	0.4	1.5	4.88	E=0.4	
STECF PLEN 17-01 (2017)	SAM	0.6	1.95	0.36	1.67	5.42*	EqSim	594 000
STECF EWG 17-09	SAM	0.6	1.30	0.44	1.36	2.95*	E=0.4	
Anchovy								
STECF 15-14 (2015a)	SAM	0.72	0.6	0.3	2.4	2	EqSim	139000
GFCM 2015a	SAM	0.72	0.99	0.55	1.31	1.8	EqSim	91872
STECF 16-22 (2016c)	SAM	0.72	1.33	0.48	1.5	2.77	E=0.4	
STECF PLEN 17-01 (2017)	SAM	0.72	1.33	0.5	1.44	2.66*	EqSim	195 000
STECF EWG 17-09	SAM	0.72	1.33	0.57	1.26	2.33*	E=0.4	

* The comparison F/F_{MSY} from STECF PLEN 17-01 and STECF EWG 17-09 is based on two different terminal years, respectively 2015 and 2016.

EWG 17-09 also proposed a range of F_{MSY} values based on a regression analysis applied to a number of ICES stocks that had already computed ranges with eqSIM. However the EWG could not test the probability of upper F_{MSY} to collapse the stock in the context of a medium/long term forward simulation.

F_{MSY} Range Anchovy (0.804-0.392)
F_{MSY} Range Sardine (0.602-0.293)

AD HOC CONTRACT

The main objective of the ad-hoc contract is to propose and test F_{MSY} ranges and biomass conservation reference points in the context of a precautionary approach where fishing mortality target is at F level in line with Patterson exploitation rate= 0.4. This is

the element of change from the old MSY framework that was at the basis of ANNEX I and II of the Adriatic MAP.

The contract report should give the STECF plenary the necessary elements for comparing different approaches in establishing F_{MSY} ranges and biomass conservation reference points.

The contract should also build medium term forecast scenarios according to the proposed reference points and to different timings for achieving the F_{MSY} proxy with associated risk.

The implications of a switch from reference points derived in an MSY approach to an E=0.4 approach should be considered also generally as the same problem may arise in the preparation of the future Western Med Pelagic MAP where it may be possible that most stocks will lack a meaningful S/R and an MSY based F will not be meaningful. The CFP has clear provision for both F_{MSY} ranges and conservation reference points, and since these need to be in future MAPs a general approach that will be applied to other pelagic MAPs should be developed by STECF.

TORs for the ad hoc contractor

For the current stocks of anchovy and sardine in the Adriatic Sea the following tasks should be performed:

1.1 Under a Patterson exploitation rate of 0.4, propose a B_{lim} and B_{pa} and discuss pros and cons. Consideration on using B_{lim} = B_{loss} or B_{lim} = "lowest biomass point with significant (good) recruitment" should be made. Or any other proposal for B_{lim} that is supported by the data.

1.2 Propose and test F_{MSY} ranges to ensure that they will deliver no more than a 5% reduction in long-term yield compared to MSY (or an equivalent of E=0.4). If possible, the upper limit of F_{MSY} range should be capped at an F so that the probability of the stock of falling below B_{lim} will be less than 5%. Discuss pros and cons of the F_{MSY} ranges proposed. Provide results for all of the proposed values of B_{lim}

1.3 Propose an updated SSB MSY $b_{trigger}$ which is greater than or equal to B_{pa}, discuss pros and cons if a value is proposed.

Detail the recruitment assumptions (model mean variance and breakpoints) used to check the results presented.

TORs to be dealt with at plenary meeting

2.1 In an MSE framework test the long term sustainability of the F_{MSY} ranges and conservation reference points to ensure that the stock will not crash with a 95% probability.

Given the lack of a meaningful S/R for the anchovy and sardine stock, the conditioning of the operating model should include stochasticity in the variability of the recruitment, a suggested approach is to follow the 2 scenarios for recruitment modelling adopted in STECF EWG 16 02 Annex 08 .

2.2 Build different scenarios, including a status quo, running up to 2030 and 250 iterations, for achieving the F_{MSY} proxy with:

A linear reduction in F targeting E=0.4 in year:

2018, 2020, 2025

A catch reduction of 10% per year

A catch reduction of 20% per year

Evaluate the scenarios with different recruitment models and B_{lim} proposed and discussed

Evaluate the scenarios with different recruitment models and $B_{trigger}$ proposed and discussed

2.3 Quantify the risk of going below B_{lim} associated to postponing the reductions of catches needed to achieve F_{MSY} to 2020 or 2025 versus a reduction in 2018.

STECF Plenary Report July 2017 https://stecf.jrc.ec.europa.eu/documents/43805/1780485/STECF+PLEN+17-02_JRCxxx.pdf

STECF response

MSY approach vs. biomass escapement strategy

STECF considered the ToRs and noted that the urgent questions relate mainly to the estimation of the MSY reference points to be used in multi annual plans (TOR 1 of the *ad hoc* contract). STECF has evaluated the information on sardine and anchovy stocks in GSA 17-18, and the information available on stock dynamics (growth, maturation, natural mortality, fishery selectivity and estimated SSB and recruitment). STECF considers that there are potentially two different approaches to managing these stocks in the context of maximizing yield while maintaining precautionary exploitation. The MSY approach based on a target F_{MSY} is often problematic for short lived species and may potentially lead to losses in catches in years when the stock is large. An alternative approach, a so called "biomass escapement strategy", is more demanding in terms of timing of management information but if implemented successfully may deliver greater catch in the long term, and minimizing risks of the stock to fall at low level of stock biomass. Currently the necessary information to implement a biomass escapement management is not available at the correct times for these stocks, but there is potential to move to this approach if the managers consider it desirable. STECF has therefore provided a response to the ToRs in two sections; the first section provides the best estimates of parameters needed for the MSY approach; and the second provides a summary of a potential "biomass escapement strategy" that may deliver more catch with similar precautionary considerations.

Parameters for MSY management approach

STECF considered the work of the *ad hoc* contract – 1739 - on "Adriatic small pelagics". This contract reviewed the basis of both precautionary and MSY reference points for sardine and anchovy in the Adriatic. STECF notes that this work was done at short notice and that it was expanded during the Plenary in response to the results observed. It was agreed that TOR 2 will be addressed after the plenary meeting. The STECF would like to thank the author for his efforts in providing this work at such short notice. The *ad hoc* contract considered a range of approaches for the evaluation of the population dynamics based on SSB and recruitment estimates. The report presents the results in terms of F_{MSY} and precautionary considerations for: combined spawning stock-recruitment (S-R) functions fitted directly to S-R data; and several specific hockey stick S-R functions based on differing choices of the breakpoint in the stock recruitment relationship. STECF draws the following observations from the study:

- A direct fit to the S-R data resulted in unrealistic slope in the fitted function irrespective of the choice of model used (Ricker, Beverton-Holt or Hockey stick). The estimated slopes implied that precautionary F would be well below F=0.1 for both stocks. This is not consistent with the natural mortality used for these stocks. Therefore there is a high probability that the recruitment is affected more by other factors rather than by biomass.

- Fits to the hockey stick function with *a priori* breakpoints (see also STECF PLEN-17-01) gave results in terms of F_{MSY} which varied greatly. This highlights that MSY reference points would be very sensitive to such subjective choices.

- The results in terms of precautionary considerations (low probability to fall below B_{lim}) were found to be very sensitive to temporal autocorrelation observed in recruitment, with estimates of F_{MSY} changing from 0.58-0.99 for anchovy and 0.18 to 0.99 for sardine depending on whether autocorrelation was included or not. This autocorrelation was calculated to be between 0.90 and 0.95 in the SAM assessments for both species, but this value is considered unrealistically high. It is indeed considered that the assessment is likely to overestimate autocorrelation in recruitment due to two effects: the knife edge slicing of length distribution over ages in the preparation of the catch at age composition used in the assessments, particularly for the early years of the time series; and due to the S-R assumptions in the SAM model (random walk model).

These considerations are further developed below.

The use of the S-R models alone as the basis for $F_{MSY,}$ as described in the *ad hoc* contract, was thus considered to be rather uninformative for F_{MSY} confirming the evaluation presented by STECF in PLEN-17-01.

However, the modelling approaches used were useful for estimating biomass reference points for these stocks. All the hockey stick S-R models gave very similar results for estimates of B_0 (i.e. the equilibrium biomass for F=0). This approach uses the S-R pairs to establish the mean (and variance) of long term recruitment and is used to give estimates of average biomass at F=0. It was concluded that B_0 for anchovy and sardine in GSA 17-18 could be estimated as 100 755 and 564 610 tonnes respectively. STECF considers that these estimates of $B_{0,}$ although being conditional on the assumptions of natural mortality in the assessment and the choice of a hockey stick stock-recruit function, are insensitive to the choice of breakpoint and autocorrelation that are causing so much uncertainty in F_{MSY}. STECF therefore considers that these values of B_0 form a reasonable basis for biomass considerations.

In the absence of signals in the S-R data, B_0 can be used to infer values of B_{lim}. Following guidelines used by other RFMC as IOTC (e.g. IOTC 2017) fractions of B_0 are used to define B_{lim}. The fraction varies over a narrow range between 0.20 and 0.15 (Goodyear 1990). STECF considered both options and noted that $0.2*B_0$ lay just within, or just below the historic lowest point in the time series for both stocks (B_{loss}), whereas $0.15* B_0$ lay well below B_{loss}. STECF considered that it would not be good practice to set B_{lim} well below B_{loss} and therefore recommends that the factor of $0.2*B_0$ be used as a basis to define B_{lim} for both stocks. The precautionary biomass reference point B_{pa} is then based on the ICES procedure and a 20% CV. This resulted in the following proposed precautionary and limit biomass reference points:

Stock	Reference point	Value	Technical basis
anchovy in GSA 17-18	B_{lim}	20155 tonnes	B_0 * 0.2
anchovy in GSA 17-18	B_{pa}	28007 tonnes	B_{lim}*exp(1.645*0.2)[1]
sardine in GSA 17-18	B_{lim}	112922 tonnes	B_0 * 0.2
sardine in GSA 17-18	B_{pa}	156913 tonnes	B_{lim}*exp(1.645*0.2)[1]

[1] STECF notes that the precision of the SAM assessment model suggests that the CV on the estimate of SSB in both stocks is around 0.12-0.14. However, this CV excludes two important error terms, process error within the model, which is not included in any subsequent evaluations and model uncertainty which is unknown. STECF therefore considers that these values are likely underestimated and thus prefers the value of 0.2 which is used as standard value for many assessments by ICES.

STECF recommends the use of these biomass limit reference points (B_{lim}) for the current development of the MSY management plans (conditionally upon that the stock assessment methodology remain the same).

In PLEN-17-01, STECF considered the values for F_{MSY} for these stocks and noted that there was considerable sensitivity of the reference points to the different approaches for the modelling of the stock recruitment relationship. The same sensitivity has been found by the *ad hoc* contract summarized above. STECF could find no basis based on modelling considerations to choose between values, and the range of values was substantial. STECF PLEN 17-03 therefore further explored the values derived from Patterson (1992) and recommended by STECF PLEN-17-01 in March 2017. STECF examined the precautionary considerations for the target F values consistent with the empirical Patterson (1992) approach of E=0.4 (with E exploitation rate=F/Z, the ratio between fishing mortality and total mortality Z=F+M).

STECF noted that all the preliminary evaluations had already shown that an MSY $B_{trigger}$ (to reduce F at low biomass) would be necessary in the MSY approach if the candidate F_{MSY} values have to be precautionary. STECF therefore tested these F values only with MSY $B_{trigger}$ and used the standard initial value of MSY $B_{trigger}=B_{pa}$. As values of B_{lim} have now been determined (see above) stock models and the basis of precautionary considerations were based on the values of B_{lim} given above. The breakpoint of the hockey stick S-R function was set at B_{lim} and fitted to the full time series of S-R data for each stock, thus the simulations were consistent with the values of B_0. Precautionary considerations were accounted by insuring that the probability of SSB falling below B_{lim} would be less than 5% when fishing at F_{MSY}, which is the standard approach used by STECF and ICES. The table below summarizes the values used:

Stock	Reference point	Value	Technical basis
anchovy in GSA 17-18	F_{MSY}	0.57	E=0.4
	MSY $B_{trigger}$	28,007 tonnes	B_{pa}
sardine in GSA 17-18	F_{MSY}	0.44	E=0.4
	MSY $B_{trigger}$	15,6913 tonnes	B_{pa}

The estimates of F_{MSY} in the current analysis (0.57 for anchovy; 0.44 for sardine) and the estimates given in the PLEN 17-01 report (0.48 and 0.4, respectively), were each derived on the basis of Patterson's (1992) E=0.4 approach. The differences between the estimates are attributable to a few changes performed during EWG 17-09 (minor change in the model settings; changes to the input catch at age data and the computation of mean natural mortality restricted to the same ages as those used to compute mean fishing mortality) and during PLEN 17-03 (SoP corrections made to the final stock assessments results for both stocks and average values computed using values from the most recent 10 years).

The status of both stocks with regards to the reference points is given in Figures 5.7.3 and 4, and the corresponding harvest control rule is given Figure 5.7.5.

The evaluations were conducted using MSY evaluation software EqSim (ICES 2017) and fully documented in the *ad hoc* contract report.

The results showed sensitivity to the inclusion or exclusion of autocorrelation in recruitment. With no autocorrelation included, precautionary Fs were found at F=0.99 or less for both species. With the very high levels exhibited in the S-R data (~0.95) precautionary Fs were F=0.18 or less for sardine and F=0.56 or less for anchovy. A degree of autocorrelation in recruitment is to be expected but the value of 0.95 observed from the data used is unrealistic. A plausible intermediate value (0.5) for autocorrelation in recruitment was tested and the resulting target F values for both sardine and anchovy (F=0.44 and F=0.57 respectively) were assessed to be precautionary. Hence, with the data and information currently available, the STECF considers that at present, the estimates of F=0.44 for sardine and F=0.57 for anchovy can be considered suitable candidate values for F_{MSY} for these stocks.

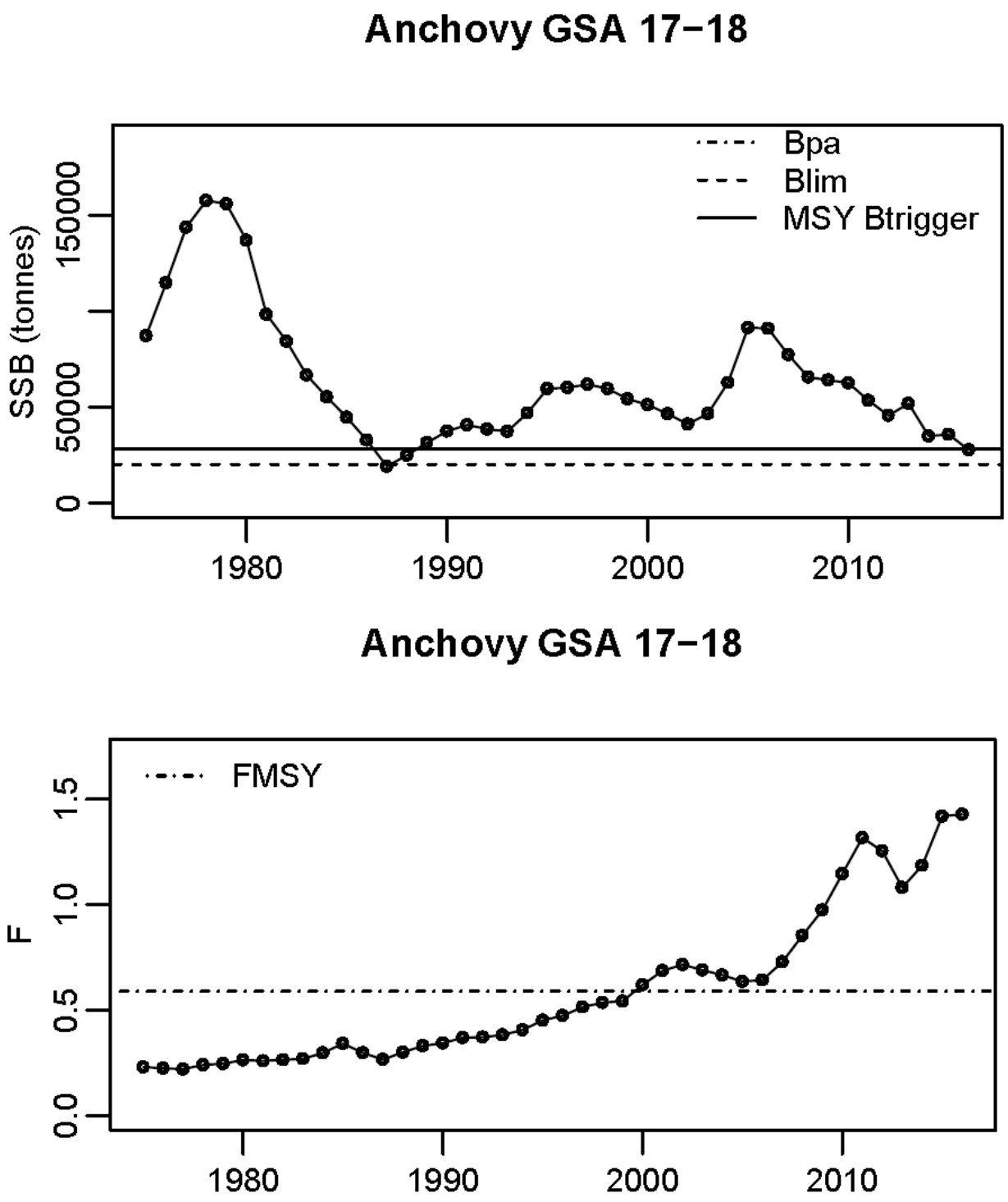
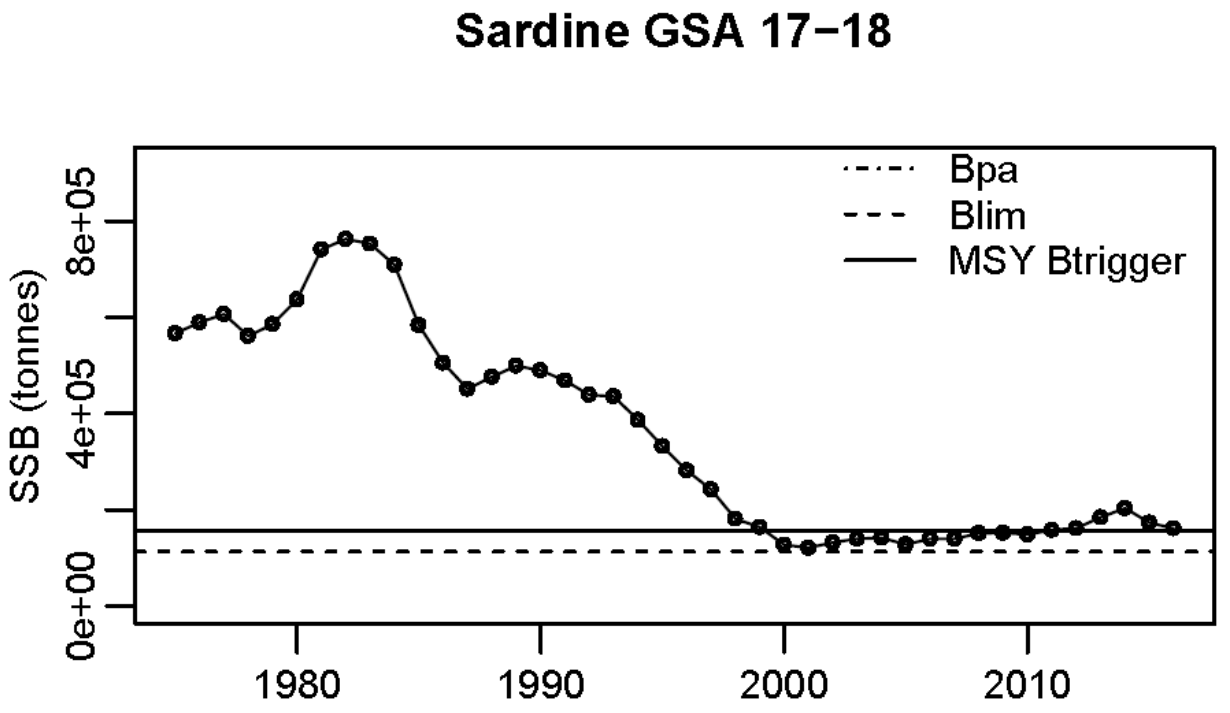


Figure 5.7.3. Trends in median SSB and F in relation to reference points, anchovy GSA 17-18. MSY $B_{trigger}$= $B_{pa.}$



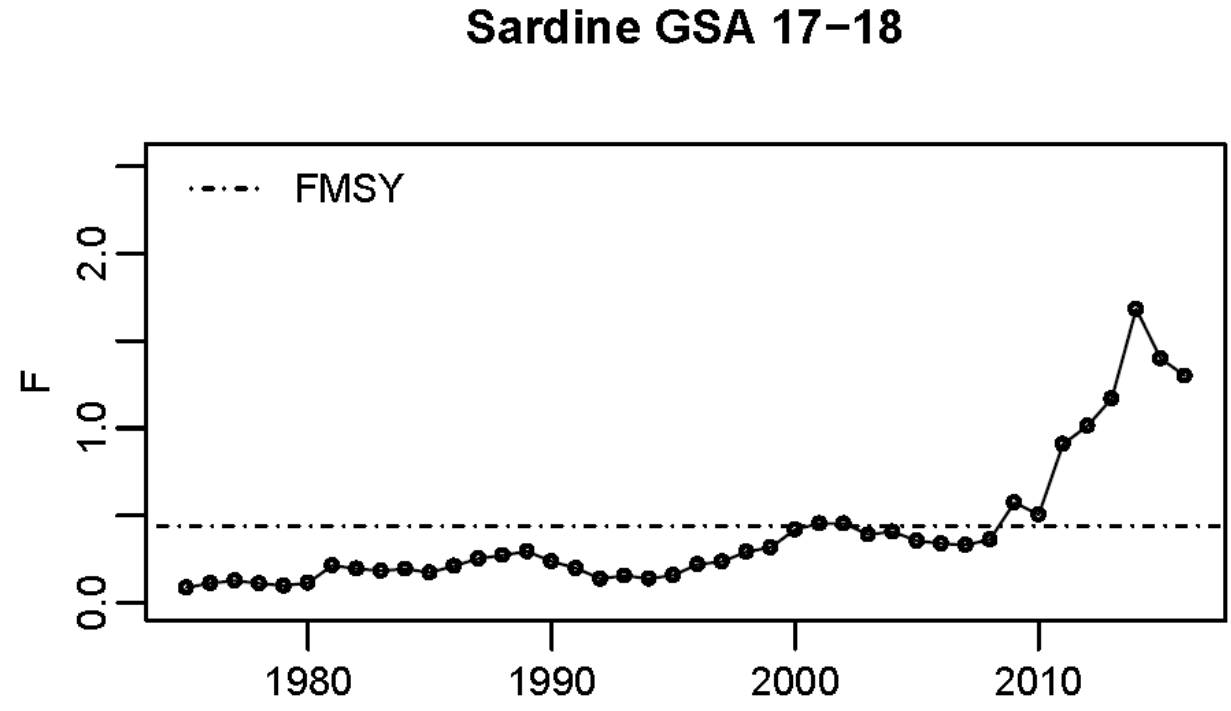


Figure 5.7.4. Trends in median SSB and F in relation to reference points, Sardine GSA 17-18. MSY $B_{trigger}$= B_{pa}.

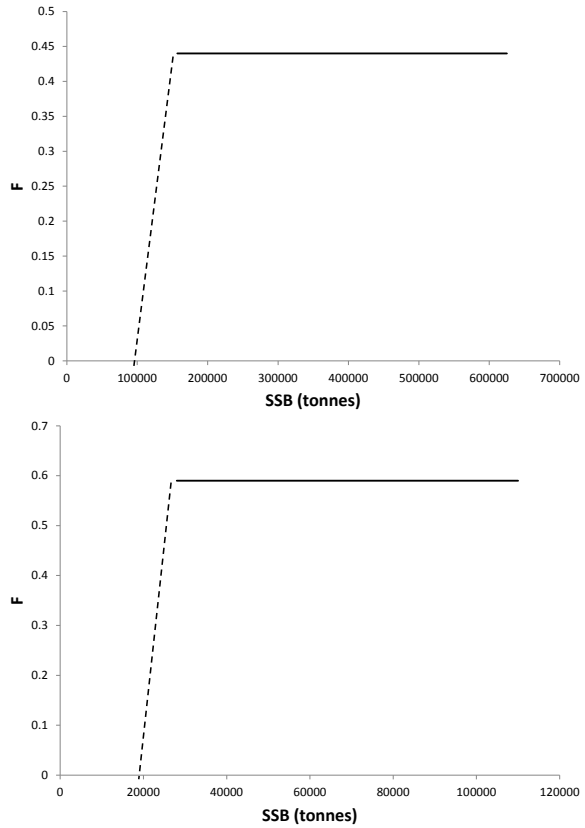


Figure 5.7.5. Harvest control rule showing how F in the short-term forecast relates to SSB in the assessment: $F=F_{MSY}$ when $SSB \geq MSYB_{trigger}$, straight line; $0 < F < F_{MSY}$ when $B_{lim} \leq SSB < MSYB_{trigger}$, dotted line; and $F=0$ when $SSB<B_{lim}$.

STECF EWG-17-09 calculated MSY ranges to go with the MSY F reference points considered above, using regressions based on other stocks for which these ranges have been estimated (cf. sections 6.7 and 6.8 – EWG report). Given the evaluations reported here STECF considers that the F_{upper} should be limited to F_{MSY} and higher values should not be considered precautionary. STECF agrees with the EWG report 17-09 that the values of F_{lower} can also be considered precautionary.

In conclusion, STECF considers that the biomass reference points given above are well supported and recommends that they be adopted for these stocks. STECF has explored a wide range of potential F_{MSY} parameters and concludes these are rather uncertain and sensitive to assumptions that cannot be validated with the current data. The arguments presented in PLEN 17-01 remain thus valid and STECF therefore concludes that the basis of E=0.4 for F_{MSY} values should be retained. The slight differences in F_{MSY} between PLEN 17-01 and PLEN 17-03 arise from differences in the calculation of mean natural mortality M that have been performed during the EWG 17-09, but the basis of the approach is unchanged.

The evaluations also suggest that these values of F are likely to be precautionary. STECF therefore recommends the continued use of these values in the MSY approach along with the B_{lim} and $B_{trigger}$ defined above. For MSY ranges F_{upper} should be limited to F_{MSY} and F_{lower} can be used directly. The values recommended by STECF are summarized in the table below:

Stock	Reference point		Value	Technical basis
anchovy GSA 17-18	Biomass	B_{lim}	20155	B_0 * 0.2
		B_{pa}	28007	B_{lim}*exp(1.645*0.2)
	MSY approach	F_{MSY}	0.57	E=0.4
		MSY $B_{trigger}$	28007	B_{pa}
	MSY ranges	F_{upper}	0.57	MSY
		F_{lower}	0.39	LongTerm Yield=95% MSY
sardine GSA 17-18	Biomass	B_{lim}	112922	B_0 * 0.2
		B_{pa}	156913	B_{lim}*exp(1.645*0.2)
	MSY approach	F_{MSY}	0.44	E=0.4
		MSY $B_{trigger}$	156913	B_{pa}
	MSY ranges	F_{upper}	0.44	MSY
		F_{lower}	0.29	LongTerm Yield=95% MSY

Changes in maturity ogive for anchovy GSA 17-18

After the evaluations carried out by STECF PLEN 17-03, The GFCM small pelagic WG met in Rome and further investigated the sardine and anchovy in GSA 17-18. The WG highlighted that there were conflicts in the ageing, assessment timing, and the treatment of potential within year spawning for anchovy. STECF 2017 assessment, as well as the data used in the present request, considers maturity at age 0 to be 0.

If maturity at age 0 was considered to be 0.5, as in the 2016 GFCM benchmark assessment, this would scale the biomass estimates in the stock assessment, and biomass reference points would need to be scaled up as well.

A conversion of the reference points from the values presented above to the alternative maturity scale at age 0 would give the following reference points;

B_0 = 160 886 t

Blim = 0.2*B0 = 32 177 t

Bpa= B_{lim}*exp(1.645*0.2)=44712 t.

Management using biomass escapement

Introduction

The MSY $B_{escapement}$ strategy (ICES 2017; WKMSYREF5 2017) is used by ICES for stocks of short-lived species that either (a) die after spawning, such as capelin, or (b) have very high natural mortality implying that future SSB is largely independent of survival after spawning, such as North Sea sprat or anchovy. Sardine and anchovy in GSA 17-18 have a large M and fall in category (b) of the ICES classification.

A constant F strategy (F_{MSY}) removes a defined fraction of the stock as long as the stock is above a given threshold. This works well when the stock maintains a small range of biomass and natural mortality is low, so that the fish not caught in one year survive and are available again a year later. When the stock is more variable, then the required limit biomass (B_{lim}) does not correspond to a fixed fraction of fishing mortality. In this

situation a more suitable strategy for highly variable stocks is to utilize a higher fraction when the stock is high and a smaller fraction when the stock is low, but always maintain a high probability of sufficient biomass. This approach is described as a biomass escapement strategy. The strategy requires a projected probability if SSB < B_{lim}. This can but does not necessarily require a F_{cap}.

Catch = Catch (< 5% risk of SSB <= B_{lim})

And optional (F < F_{cap})

This management procedure normally requires simulations to evaluate risk, and the risks may be acceptable at F_{cap} set higher than F_{MSY}, though that procedure may also imply closure if the stock is close to B_{lim}.

MSY $B_{escapement}$ is defined by ICES as a deterministic biomass limit below which a stock is considered to have reduced reproductive capacity. $B_{escapement}$ is often set to B_{lim} and the object of the plan is to have a high probability to keep SSB>B_{lim}. For some other stocks a fixed MSY $B_{escapement}$ value is applied in the advice, complemented with an upper limit to F (i.e. F_{cap}). This ensures that a greater margin is applied when the stock is large; however, F_{cap} is not directly analogous to F_{pa} or F_{lim}. The reference points F_{pa} and F_{lim} are not considered relevant for those stocks of short-lived species for which the advice is based on biomass escapement strategies.

F_{cap} is defined to limit exploitation rates when biomass is high. A large stock is usually estimated with greater uncertainty, i.e. when the catch is taken, the uncertainty in the amount of biomass that will escape fishing is greater. By capping the F, the escapement biomass is effectively increased in proportion to stock size, maintaining a high probability of achieving the minimum amount of biomass left to spawn. The yearly TAC is thus based on a 5% probability of SSB falling below B_{lim} following the fishery, and an overall limit to exploitation rate if the stock is high. B_{lim} is set based on the observed dynamics of the stock (see section above). Overall it is expected that catches in good years can be higher under the biomass escapement strategy. Thus, sardine and anchovy in GSA 17-18 should be considered for being managed using a MSY $B_{escapement}$ strategy *sensu* ICES (2017).

Requirements for a $B_{escapement}$ strategy for Sardine and Anchovy in GSA 17-18

In order to move to management of the fisheries on these two stocks using the $B_{escapement}$ strategy there are a number of steps:

- Agree that the approach should be developed and evaluated
- Identify which information can be obtained from surveys (August and Sept) and fisheries (quarterly) to give the necessary management data quickly.
- Using the available data flow, evaluate the parameters of the harvest rules that can be implemented to maximize catch while maintain SSB>B_{lim} with a high probability.
- Put in place the timetable for data collection, data analysis, provision of catch advice, and decision process to define TAC.
- Implement the required data collection, analysis, decision process.
- Move to management using this approach.

Potential information flow for sardine and anchovy in GSA 17 & 18 are given in Figures 5.7.6 and 7, reproduced from STECF (2016, EWG 16-22). The approach requires that survey data be evaluated quickly, following for example the data flow used for Anchovy

in Bay of Biscay (ICES 2017) which is managed in this manner. It is not expected that the approach will increase the total workload, as surveys and data analysis are needed for both MSY and $B_{escapement}$ management. However, this alternative approach does require experts to deliver results more quickly, but no quicker than the regime already in place for Bay of Biscay anchovy. It is understood by STECF that current regulations require delivery of data only 6 months after data collection, which would not allow the escapement strategy to be followed effectively, however, managers may wish to deliver data earlier (see Figures 3 and 4) in order to obtain the benefits of the fishery managed in this way.

Once the data availability has been agreed it will then be possible to parameterize the models to test different strategies for managers to consider. Then, if a satisfactory approach is found, management can be moved to this regime. It is anticipated that the development of this process may take a few (2+) years to complete the necessary planning and evaluations.

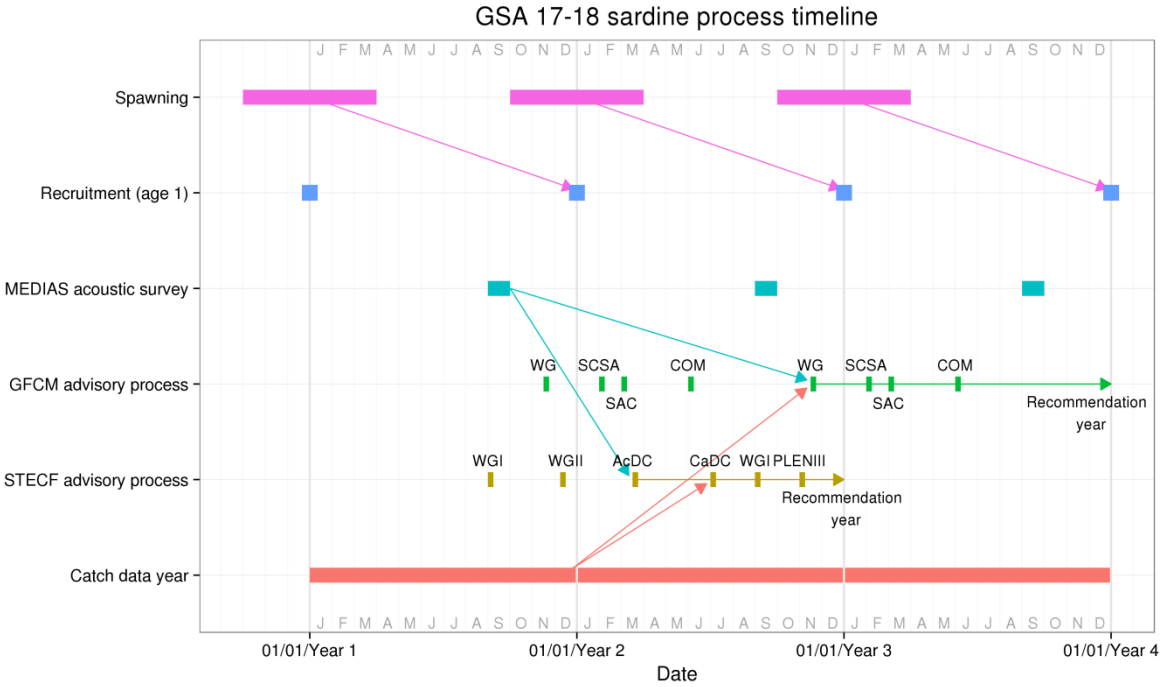


Figure 5.7.6. Adriatic Sardine recommendations timeline: illustrating the biological (spawning and recruitment), survey and advisory processes. GFCM advisory process steps comprise the: Working Group on Stock Assessment of Small Pelagics Species (WG); Subcommittee on Stock Assessments (SCSA; recently SRCs or SRC-AS for the Adriatic); Scientific Advisory Committee (SAC); Mediterranean Commission (COM). STECF advisory process steps comprise the: March acoustic data call (AcDC), which is currently slightly ahead of DCF data submission requirements; June catch data call (CaDC); Mediterranean assessments part 1 (WGI); winter plenary (PLENIII). Arrows on the advisory processes follow the flow and timing of data into the advisory process through to the year in which the recommendation / advice pertains to.

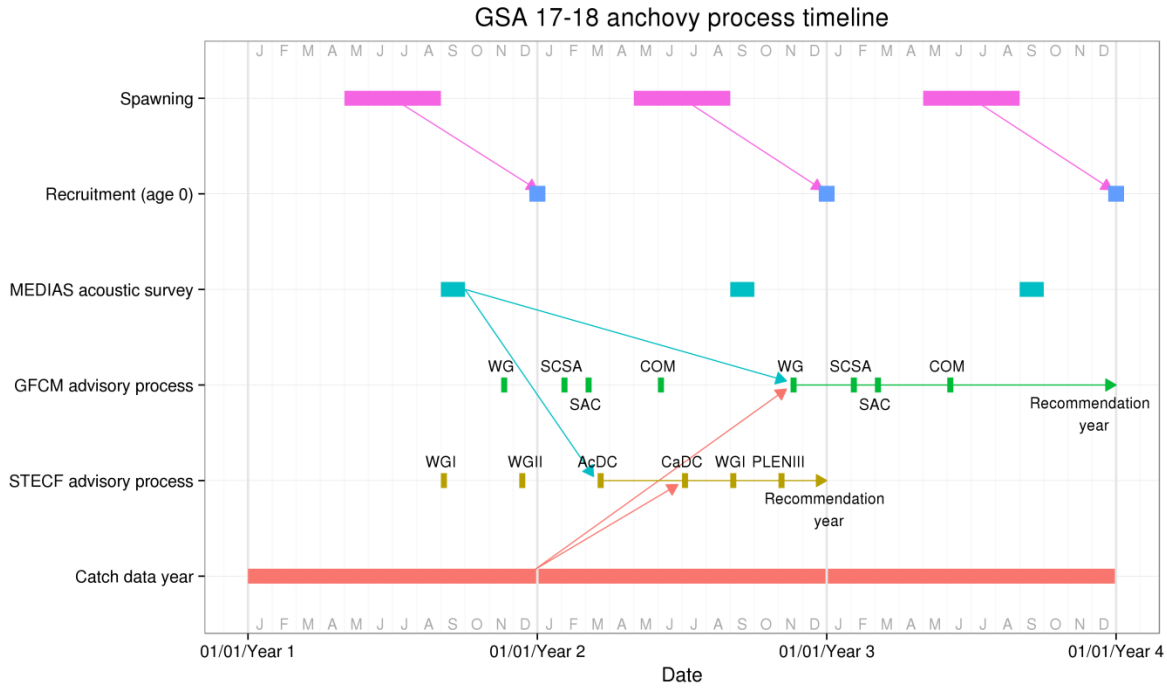


Figure 5.7.7. Adriatic Anchovy recommendations timeline: illustrating the biological (spawning and recruitment), survey and advisory processes. Note that the recent GFCM change to calendar year catch data for this species (GFCM, 2015) is reflected. GFCM advisory process steps comprise the: Working Group on Stock Assessment of Small Pelagics Species (WG); Subcommittee on Stock Assessments (SCSA; recently SRCs or SRC-AS for the Adriatic); Scientific Advisory Committee (SAC); Mediterranean Commission (COM). STECF advisory process steps comprise the: March acoustic data call (AcDC), which is currently slightly ahead of DCF data submission requirements; June catch data call (CaDC); Mediterranean assessments part 1 (WGI); winter plenary (PLENIII). Arrows on the advisory processes follow the flow and timing of data into the advisory process through to the year in which the recommendation / advice pertains to.

STECF conclusions

Based on the findings in the report of the EWG 17-09, the report prepared under ad-hoc contract (Request for services – 1739 - Ad hoc Contract on "Adriatic small pelagics" Cardinale, M.) and the additional findings described in this report, STECF concludes the following:

1. The most robust candidate values for B_{lim} and B_{pa} for anchovy and sardine in GSA 17-18 currently available are as follows:

	B_{lim} (tonnes)	B_{pa} (tonnes)
Anchovy in GSAs 17 & 18	20155	28007
Sardine in GSAs 17 & 18	112922	156913

Including a different maturity ogive, such as considering that maturity at age 0 is higher than 0 for anchovy, would scale up the spawning biomass levels but would not affect the general trends in the stocks. Biomass reference points would though need to be scaled

up accordingly. STECF has suggested a possible conversion corresponding to a maturity at 0.5 for age 0.

2. The estimates for F_{MSY} for both sardine and anchovy in GSAs 17 & 18 derived using Patterson's (1992) approach of E=F/Z=0.4 were assessed to be precautionary and STECF considers that the best candidate values for F_{MSY} currently available are as follows:

F_{MSY}

Anchovy in GSAs 17 & 18 F = 0.57

Sardine in GSAs 17 & 18 F = 0.44

3. A biomass escapement strategy would be potentially more suitable than a F_{MSY} approach for the management of these small pelagic stocks. Such a strategy would not require more data to be collected, but would require the data to be provided earlier, and the assessment and management procedures to be performed more rapidly.

References

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5.8 CFP monitoring

Background provided by the Commission

DG MARE intends to request STECF in 2018 to continue the monitoring of fish stocks with respect to the CFP objectives relevant to exploitation of the stocks with respect to maximum sustainable yield). This should continue reporting on the level of fishing mortality relative to F_{MSY}, or alternative proxies and stock status relative to safe biological limits including B_{pa} and MSY $B_{trigger}$. Extension of the analysis to cover proxies for MSY parameters for data-limited stocks is also encouraged.

While STECF is encouraged to maintain as much stability in the analysis as possible, DG MARE would welcome further methodological development with respect to the reporting of the above-mentioned parameters, and also with respect to monitoring Mediterranean fish stocks.

DG MARE understands that JRC and possibly others have been working on these topics. Such work should be reviewed and any methodological conclusions should be drawn by STECF before the next reporting iteration. For 2018, the evaluation report should be finalised after the Mediterranean assessments have been adopted. EEA, ESTAT and GFCM secretariat should be kept informed of methodological developments.

Background information is provided on: https://stecf.jrc.ec.europa.eu/plen1703

Request to the STECF

1) On the basis of intersessional work by JRC and any other relevant material, make any appropriate methodological recommendation for the monitoring of fish stocks in relation to the MSY objectives of the CFP.

2) As far as practicable and considering the outcomes of ToRs 3 and 4 as well as the conclusions and recommendations of STECF 17-04 regarding the use of model-based indicators, STECF should use existing, new and adapted indicators where feasible to report on the progress on the implementation of the CFP in all sea basins, including external fisheries where EU fleets are involved.

3) Following discussions with DGMARE, STECF should consider methodological approaches for the inclusion and reporting of additional information/data including stocks for which F_{MSY} proxies and F_{MSY} ranges are available.

4) STECF is also requested to consider approaches that would permit the development of indicators that can be used to monitor progress in the setting of fishing opportunities in line with the objectives of the CFP by contrasting FMZ catch options with TAC Commission proposals and TACs adopted by the Council.

5) Given the conclusions of STECF 17-04 on the requirement to further include stocks that are assessed by STECF but are not included in the list of reference stocks (sampling frame), STECF is requested to define and identify the necessary adjustments to the criteria used to define the sampling frame to permit the inclusion of such stocks.

STECF response

This TOR relates to the ongoing requirement of the Commission to report progress towards implementation of the CFP. In previous years, STECF has discussed and

provided advice on the development of fishing mortality and stock biomass indicators leading to a formal evaluation exercise carried out by JRC experts. The most recent report was reviewed by STECF at its 2017 spring plenary (STECF-PLEN-17-01). The report contributed information on progress towards achieving F_{MSY} and stocks within safe biological limits on key fish stocks managed by the EU. The requests associated with this TOR mainly deal with the further development of this aspect of CFP monitoring.

DG MARE has also expressed a need to be able to monitor and report on a wider range of ecosystem effects noting that the 2013 CFP Regulation *shall implement the ecosystem-based approach to fisheries management so as to ensure that negative impacts of fishing activities on the marine ecosystem are minimised* (Article 2). The current STECF plenary report includes a more detailed discussion section 6.7 on potential indicators that could be utilised for this process. This topic is however an integral part of the overall DG MARE approach to CFP monitoring and suggestions for planning and developing this work are included in this section.

During preliminary discussion of this TOR, STECF quickly concluded that the requests represented a substantial amount of work, particularly considering that the previous CFP monitoring report itself contained a series of outstanding issues that required to be addressed. In light of this, and in discussion with DG MARE it was decided that a two stage approach was preferable, dividing the work into a) those elements that require to be addressed ahead of the next evaluation in 2018 and b) items that will require longer to develop or rely on new information that is beginning to emerge but is not yet fully available. The remainder of this response is split into two sections and the specific requests to STECF are dealt with accordingly and not necessarily in the order presented in the TORs.

Preparations for 2018 evaluation

The essential message in the background to the TOR (as provided by DG MARE) was that STECF was not expected to reopen discussion on the approach used in the previous CFP monitoring and that it was desirable to maintain some stability and to build on the earlier approach by, if possible, extending the scope and range of stocks covered and addressing a few concerns raised during the previous evaluation.

Table 5.8.1 provides a list of issues requiring attention before the next evaluation in 2018. These were identified previously by STECF (STECF-PLEN-17-01) by DGMARE (current TORs) and by the JRC (including WD prepared in 2017). The issues principally relate to recommendations on specific indicators in the CFP evaluation, to the list of reference stocks and to aspects of the methodological approach. In order to provide clarity ahead of the analysis and evaluation by JRC, STECF discussed the issues in some detail and agreed the approaches to adopt. This generated a series of actions which are also included in Table 5.8.1. Some of the issues raised were straightforward to address, while 3 others had less obvious answers and required a decision to be made:

- STECF recognises the need to provide an indicator based on B/B_{MSY} as soon as possible and will closely monitor scientific output from ICES to ensure that this calculation is presented at the earliest opportunity. In the meantime, STECF will provide results for an indicator reporting the number of stocks below MSY $B_{trigger}$ and/or exploited above F_{MSY} using values currently adopted by ICES for MSY $B_{trigger}$. This will replace the indicator previously referred to as "CFP requirements"
- On the list of reference stocks (also referred to as "sampling frame"), the previous STECF approach for the Mediterranean was based on a combined list including the top 10 stocks by GSA in landings and the top 10 stocks in value. This resulted in some species not selected as important across all GSAs and some

stocks previously assessed were thus being left out of the CFP evaluation. For 2018, STECF will establish a species-based reference list and thus add these identified missing stocks (species*GSA) to the original list of stocks in the sampling frame. This extended list will form the new, more representative, sampling frame.

- Trends in fishing mortality indicator were previously presented both in terms of mean values (overall and for different regions etc.) and in terms of modelled values for the overall assessment. STECF has reconsidered this approach and now proposes to only present modelled values (overall and for different regions). Additional exploratory analysis demonstrated that earlier concerns about impaired performance of modelled outputs where the number of stocks in a region was rather small, could be set aside. Modelled outputs appear to provide reliable trends which, for most regions, are fairly insensitive to changes in the stocks available in the analysis.

STECF agreed that for 2018 the report prepared by JRC would consist of two sections as follows:

a) A core section containing the indicators:

- Number of stocks where fishing mortality exceeds FMSY
- Number of stocks where fishing mortality is equal to or less than FMSY
- Number of stocks outside safe biological limits
- Number of stocks inside safe biological limits
- Annual value of F/FMSY
- Trend in SSB

b) A supplementary section containing indicators which are less developed or presently subject to incomplete information.

Table 5.8.1. Recommendations, TORs and issues relating to work for 2018 with STECF decision and suggested implementation.

Recommendations from previous STECF reports/or requests from DGMARE in ToR	Source	Subject	Comments arising during initial discussion between STECF and JRC of the recommendations and requests	STECF decision and suggested implementation
STECF suggests that the number of stocks by category (1, 2 and 3) for which ICES issued an advice, in the last year of the analysis, to be computed and published in next year's EWG report.	PLE1701	New indicator	Is this one estimated by ICES ? Or do we have to construct one	2018 - ask DG MARE to formally request ICES to provide the list
For Category 1 stocks, the proportion of stocks from EU waters assessed by ICES for which reference values (FMSY, Bpa and BMSY) are known should also be computed, at least for the last year in the analysis.	PLE1701	New indicator	Is this one estimated by ICES ? cf above	2018 - JRC to provide as part of the evalution process
STECF suggests that as soon as a representative number of BMSY estimates become available from ICES assessments, the proportion (and number) of stocks below or above this reference point should be computed, together with an indicator of trends in the B/BMSYratio.	PLE1701	New indicator	ok -agreed. But number very limited at the present time	Incorporate once available. STECFand JRC to continue to monitor progress on generation of Bmsy values. Evaluation report to state number of stocks with a Bmsy estimate
JRC Q. What do we do about the 'CFP requirement' on biomass indicator	PLE1703	Indicator query	Do we keep Bpa or try something else - we are not able to use Bmsy Now that ICES computes MSY Btrigger suggest we use that when it is available?	2018 - Use ICES MSY Btrigger values and discontinue use of 'CFP requirement' label.
STECF recommends all stocks assessed by EWG should be added to the reference list. Criteria used to define the sampling frame should be revised accordingly, and will be discussed in a next STECF plenary meeting.	PLE1701	Sampling frame	Sampling frame AKA Reference list is used to stabilize the basis on which the indicators are computed, (i) avoiding stocks that are not relevant to be added, e.g. some GFCM stocks, (ii) used as bases for scientific coverage indicator. Three options exist: expand 10 to xx, use all stocks assessed by STECF, build a list of species (HKE, NEP, etc) which should be merged with the current sampling frame.	2018 - Continue with existing list based on 10 top stocks by landings and 10 top stocks by value and ADD key important species which have been assessed but were missed in the previous analysis. JRC to consult with Med. Experts on appropriate species to add.
DGMARE request. STECF is requested to define and identify the necessary adjustments to the criteria used to define the sampling frame	PLE1703	Sampling frame	See above. Request particularly in relation to the Mediterranean.	2018 - see above
STECF recommends that, in case the assessments do not cover the very last year (or the two last years), the time series should be extended with the final year estimates over these years.	PLE1701	Methodology	Note that for Med it means extending tens of stocks.	2018 - JRC to extend the time series and review the ouputs and effect on model fitting etc
STECF considers that the model-based indicators should be adopted as the standard method to be used for every time series (including indicators per Ecoregion and indicators for stocks outside EU waters).	PLE1701	Methodology	Check background 'testing' docs provided by JRC at Plen 1703 on indicators arising from EU regional models and models from outside of the EU.	2018- Move to model based indicators for overall and regional outputs and discontinue use of mean
STECF suggest that Indicators based on fully assessed stocks could be complemented by an additional index computed jointly for all stocks of DLS categories 1 to 3 after standardization.	PLE1701	Methodology	Cat 1-3 together ? We're using 1, 2 split from 3. Why put these things together? Also note cat 1 and 2 are more likely to have B reference points	2018- Continue with 1+2 split from 3 and also ADD an additional index of 1-3 combined.

Future developments in CFP monitoring

This section contains observations and discussion on both longer term developments required to extend and improve the existing process of CFP monitoring and on a 'roadmap' towards a more holistic ecosystem approach. The ambition being to identify aspects of ecosystem monitoring that informs on the progress towards reducing the *overall* effects of fishing on the ecosystem.

STECF quickly concluded that several of the requests in the TOR relating to improvements in the *existing* process either required more time to develop a robust approach or were hampered by incomplete information at the present time. DG MARE acknowledged the need to allow sufficient time and indicated that some additional resources might be available to assist the process and contribute to 'data mining' exercises etc. Table 5.8.2 identifies three particularly challenging issues.

STECF suggests that the request to broaden the scope of the evaluation to cover regions in which EU external fleets operate would benefit from a limited number of case studies in the first instance. STECF notes there are a large number of RFMOs covering waters where EU fleets operate. In some of these RFMOs, the extent of participation and the influence of EU management are very small. Furthermore, publication or access to data with which to conduct an analysis is limited. In RFMOs where these limitations are less obvious (e.g. ICCAT, IOTC, CECAF), however, there may be scope to conduct case study evaluations over the next couple of years.

One of the requests relates to the incorporation into the ongoing analysis, stocks for which F_{MSY} proxies are available. STECF notes that its current analysis is based on all available scientific advice and that where any of the available advice already contains a F_{MSY} proxy output (e.g. stocks assessed with a surplus production model), this is already included. STECF further notes that although ICES has been gradually increasing the number of stocks for which proxies are available, this process is not complete and rather few of the proxy values are so far included in its advice. This situation is expected to change over the next few years and STECF suggests that it will continue to monitor this progress and utilise the information as soon as possible.

DG MARE requested the STECF to develop an indicator which compares the scientific advice for stocks with the Commission initial proposals and one that compares these proposals with the final agreed TACs. The STECF notes that such an indicator represents a form of 'governance' indicator reflecting the performance of the management process. The STECF notes that the process of developing and calculating this type of indicator is not straightforward, particularly where scientific advice for a unit stock is then used as the basis for TACs in multiple areas. More difficult still are situations where several stocks assessed and advised on separately are grouped together (often against scientific advice) into global TACs covering quite a wide area (e.g. *Nephrops* in the North Sea). The STECF requires additional time to investigate how best to access all the required information (comprehensive TAC proposal lists, resultant catching opportunities etc.) and to address the problems outlined above. In order to avoid an 'ad hoc' approach, the STECF suggests developing a 'decision tree' system to guide the analysis.

Taken together, these three new issues represent a considerable body of work for which manpower resources in the short term are not available. The current analytical work on CFP monitoring is carried out by the JRC, attempting to add all these new requests to their workload is not an acceptable solution. The STECF suggests that a dedicated EWG allowing time for adequate discussion, sourcing of information etc. would be beneficial.

The STECF extended the discussion to consider how in the medium to longer term an evaluation based on a wider range of ecosystem indicators reflecting the impact of activities covered by the CFP could be set up. DG MARE asked STECF to consider what this might look like and how it would relate to other EU objectives such as GES and the

MSFD process. Some *early thinking* by STECF on potential candidate ecosystem indicators and structural approach is detailed in section 6.7 of this plenary report. STECF considers it important that as far as possible existing indicators are utilised and that developing a carefully considered and limited list of key indicators would be preferable to any attempt to generate an exhaustive list.

Given the complexity of this topic and the need to consider additional aspects such as how to align fishery regions with regions considered representative of different ecosystems, STECF again considers this would be best tackled in a dedicated EWG. STECF suggests that the most efficient approach would be to set up a combined 'CFP monitoring EWG' allowing for a structured and careful consideration of CFP monitoring covering broader aspects of the ecosystem.

Table 5.8.2. Recommendations, TORs and issues relating to longer term work with STECF decision and suggested implementation.

Recommendations from previous STECF reports/or requests from DGMARE in ToR	Source	Subject	Comments arising during initial discussion between STECF and JRC of the recommendations and requests	STECF decision and suggested implementation
DGMARE request. STECF should use existing, new and adapted indicators where feasible to report on the progress on the implementation of the CFP in all sea basins, including external fisheries where EU fleets are involved.	PLE1703	Increased scope of monitoring	Can we use a couple of RFMOs as case studies ?	May be difficult for 2018 but initial trials will be attempted. More comprehensive evaluation probably requires an EWG
DGMARE request. STECF should consider methodological approaches for the inclusion and reporting of additional information/data including stocks for which Fmsy proxies and Fmsy ranges are available.	PLE1703	New indicator	ICES will not release new advice basis in 2018. This will take place over time	After 2018, requires consideration in EWG
DGMARE request. Monitor progress in the setting of fishing opportunities in line with the objectives of the CFP by contrasting FMZ catch options with TAC Commission proposals and TACs adopted by the Council.	PLE1703	New indicator	New governance indicator. Need to clarify which ICES advise is used (first line of advice), algorithm/decision tree to define when a stock is considered to have scientific advice etc,	After 2018, requires EWG

STECF conclusions

STECF, in discussion with DG MARE, concluded that a two stage process was preferable for tackling the ongoing development of CFP monitoring and that attempting to address and implement too extensive a list of developments ahead of the 2018 evaluation process would not be practically feasible.

STECF notes that for the 2018 analysis it will implement a number of changes (itemised in Table 5.8.1) and concludes that these will enhance the analysis and broaden its scope.

STECF concludes that requests relating to expansion of monitoring to cover EU external fleets, incorporation of F_{MSY} proxies and development of a new 'governance' indicator require more time and resources. Attempts regarding the inclusion of some RFMOs data will be trialled for the 2018 evaluation.

STECF has begun to develop ideas towards an evaluation incorporating more aspects of the ecosystem than the state of exploited species alone. STECF concludes that this process will also require more time and resources.

STECF concludes that an EWG is required to progress the issues discussed above. This will provide an efficient and more inclusive way of developing a holistic CFP monitoring, covering wider aspects of the ecosystem as well as exploited fish stocks.

5.9 Recommendation of the RCGs

Background provided by the Commission

The Liaison meeting took place on 9 and 10 October 2017 and recommendations were brought forward:

Background information is provided on: https://stecf.jrc.ec.europa.eu/plen1703

Request to the STECF

The STECF is requested to analyse the recommendations of the RCGs in the light of their possible impact on the scientific advice process (stock assessment, management measures assessment) and to inform the Commission on the possible effect of the recommendation on the data availability.

STECF observations

STECF acknowledges that the Regional Coordination Groups (RCGs) now have a legal mandate under the DCF (Art. 9 in Reg. 2017/1004). The main task of the RCGs is to co-ordinate sampling on a regional level, with the aim to establish Regional Sampling Plans.

STECF notes that the RCGs and PGECON have put forward numerous recommendations, of which the Commission selected those listed below as being relevant for STECF. These are either directly addressed to STECF, relate to issues of data collection (either new or fewer variables compared to the EU MAP or methodological) and/or reporting, relate to data calls that are handled by STECF, relate to STECF EWGs (past or future), highlight possible data gaps or relate to data availability.

The detailed STECF comments on each recommendation are provided below.

RCG North Sea and East Arctic (NS & EA) 2017

Common naming of survey	
RCG NS&EA 2017 Recommendation 1	The NS&EA RCG recommends the use of a single survey name and acronym for each survey for use in Regulation documents, workplans, assessments Working Group reports and advice sheets. These survey acronyms could/should take the form of '(Region_)Survey_(Quarter_)Member-state' e.g. NSEA_IBTS_Q1_NED. This will help end users to easily identify the surveys.
Justification	Presently it is very difficult to get an overview of the survey used in assessment and thereby give an input to update the mandatory survey list in the regulation (EU) 2016/1251 do the many different acronyms used for the same survey.
Follow-up actions needed	MS, ICES EWG, ICES secretary, STECF
Responsible persons	ICES secretary, STECF

for follow-up actions	
Time frame (Deadline)	January 2018
STECF comments	STECF supports this recommendation, in order to improve consistency.
Review of survey tables	
RCG NS&EA 2017 Recommendation 2	The RCG NS&EA recommends that member states review the information detailed in the AWP table xx of this report, in order to identify any errors or omissions with any found to be reported back to the RCG NS&EA by 1.11-2017. a. All MS all regions to review acronyms and descriptions in columns A to C (member state, acronym and region). b. MS to comment on proposed Survey IDs and amend where there are gaps and to choose and enter their preferred Survey ID in column AD. Altering columns A to C will affect the proposed IDs. MS need to be mindful that shared surveys will already be tied to some common acronym c. The RCG NS&EA recommends that ICES check the stock table in this rapport table xx for stocks used in assessment d. MS to check stock table for MS participation in column G" Member state(s) responsible for survey(s)"
Justification	The RCG NSEA has tried to produce a table giving all information on surveys presently used in assessment and conducted by all MS in the region. This table needs to be confirmed by the MS and ICES as the data information is rather diverse.
Follow-up actions needed	MS / ICES
Responsible persons for follow-up actions	Marie Storr-Paulsen DTU Aqua
Time frame (Deadline)	1/11 2017
STECF comments	STECF supports this recommendation and considers that a similar approach should be used in other regions (e.g. Med&BS).

RCG North Atlantic (NA) 2017

Collate survey information from MS for evaluation of EU-MAP Table 10	
RCG NA 2017 Recommendation 2	The RCG NA recommends that the Commission and STECF collate relevant survey information from all MS to facilitate the evaluation of the surveys listed in Table 10, as well as to collect information for inclusion in the revised version of Table 10.
Justification	During RCG NA in collaboration with ICES, it became apparent that more information was required to facilitate the evaluation of the mandatory surveys listed in Table 10. The purpose of this evaluation

	is twofold: • First and foremost, to revise and update the list of mandatory surveys in Table 10. Inclusion of new surveys and exclusion of currently listed surveys is to be done on pre-defined criteria. • Second, updating Table 10 allows for the inclusion of information facilitating future work of the RCG, e.g. in the light of cost-sharing. It is well known that Table 10 is out-dated, hence, updating Table 10 should be done on the most up-to-date information, only available to the MS involved. By collating the information through the MS, this up-to-date information on surveys can be gathered as well as additional information for future inclusion in Table 10.
Follow-up actions needed	1. Commission to consult with and take into account any response from ICES and other RCGs relating to this particular task 2. Commission to send out the designated spreadsheet to all MS giving sufficient time for MS to respond. 3. MS to respond to the request 4. Commission to collect and process all information prior to the EWG
Responsible persons for follow-up actions	Commission, National Correspondents
Time frame (Deadline)	31st November for the templates to be circulated. Deadline for a response 1 month prior to STECF EWG on Evaluation of surveys.
STECF comments	STECF supports this recommendation, as this information is vital for the EWG 17-14.
Utilisation of RDB for completion and evaluation of MS national plans	
RCG NA 2017 Recommendation 3	RCG NA recommends the investigation of methods for using Regional data base (RDB) data and metadata and automated procedures for completing, screening and evaluating MS national work plans. RCG NA recommends that MS upload data to RDB so as to be readily identifiable with the sampling commitments outlined in table 4A of national work plans. RCG NA recommends that metadata derived from the RDB can form a part of the MS annual report for evaluation by STECF of the MS national plans.
Justification	The RDB can be utilised to enable the generation of electronic metadata on the scope and quality of data collected under MS national work plans. A move to include automated meta data report(s) as part of a MS annual report would ease the workload of MS and has the potential to improve relevance of the data quality metrics used by STECF in the evaluation of MS national programmes.
Follow-up actions needed	1. MS (can chose) to upload their samples labelled with stratum ID code specified in table 4A of national work plans using the project field of the CS data. 2. RCG data subgroup to generate meta data reports that can be used to populate MS annual reports.

	3. RCG data subgroup to circulate prototype for the format of a meta data template/report to NC for consideration and agreement at RCGM 2018needs to be generated and commonly agreed upon. are generated to form part of the MS annual report used by the 4. STECF to use the reports in evaluating the execution and quality of data collected by member states.
Responsible persons for follow-up actions	MS, RCG data group, STECF
Time frame (Deadline)	MS should be able to tag their data in the RDB data call (~July 2018) related to data collected in 2017 Meta data reports could form part of the STECF AR evaluation conducted in ~Jun 2019.
STECF comments	STECF notes that this recommendation has already been considered by EWG 17-17.
Establish and maintain a pan regional RCG data end user subgroup	
RCG NA 2017 Recommendation 6	RCG NA recommends establishing a data end user subgroup. To work closely and intersessionally with ICES to improve communication; establishing common references for standard processes and information and identifying effective processes for meeting end-user needs.
Justification	Setting up this subgroup will facilitate the role of the RCG to support end users. The subgroup will act as a point of contact for data end users, a framework for feedback and allow the RCG to prioritise its activity relating to future data collection, storage and transmission functions.
Follow-up actions needed	1. RCG chairs to establish end-users subgroup (Initial members RCG chairs). 2. RCG Chairs in consultation with end-users to draft ToRs and deliverables. 3. RCG subgroup to report regularly to members.
Responsible persons for follow-up actions	Chairs of RCGs, end-users (ICES, STECF, other RFMOs).
Time frame (Deadline)	Ongoing.
STECF comments	STECF supports this recommendation (see also ToR 7.3).
Workshop to standardise methods of determining métiers from transversal data	
RCG NA 2017 Recommendation 9	The RCG NA strongly recommends a data compilation workshop to: 1. Standardise the processes that use trip based transversal data to determine the métier. 2. Consider criteria for aggregating data for different end-users (JRC, ICES and other RFMOs). Investigate a framework for managing métier and fleet descriptions when needed.

Justification	All catch, effort and sample data is uploaded to the RDB by métier and limited to a reference list of RCG agreed métiers defined by ICES area. MS submit their data to ICES on Intercatch disaggregated by métier and the JRC for FDI data calls and other RFMOs also request the data by métier without reference to the RCG agreed list of métiers. MS have independently developed their own code and processes for calculating species assemblage and rules for merging métiers. This is initially based on the transversal data for a trip which may or may not cover more than one métier. These methods are not necessarily consistent between countries and even between agencies within countries and could be based on, for example, a foreshortened list of species assemblages; rules for particular gears; catch by weight and or value and relative ratios. The impact of the different methods is not known but as data is being compared more readily at a regional or international level, so as to improve on confidence in current assumptions simple rules and standards need to apply. Since 2009 RCGNA has regularly recommended MS provide, maintain and update fleet descriptions for all sampled métiers to better define and compare similar fleets and the sampling of them between nations. This has been only moderately successful with no clear repository for them. ICES Expert Working Groups are now also requesting fishery and métier descriptions as part of their data calls. A repository and better strategy is required for collating and maintaining MS descriptions.
Follow-up actions needed	RCGs to establish a pan regional cooperative team of RCG members and end users; to consult with end users and data providers; establish a workshop; to provide terms of reference and identify a venue. Tors should include: 1. to review current algorithms and processes for allocating a trip to a métier based on catch data. 2. to provide standard guidelines for determining or allocating a trip to a métier or multiple métiers and how to aggregate the data. 3. to define a strategy for storing and maintaining national fishery descriptions relative to the defined métiers.
Responsible persons for follow-up actions	RCGs to establish the team. NC, MS and end-users to provide contributors and to implement guidelines.
Time frame (Deadline)	2018
STECF comments	STECF supports this recommendation and considers that a follow-up transversal data workshop (*cf.* Zagreb, Jan. 2015; Nicosia, Feb. 2016) should be established. With regard to a repository of métier descriptions, STECF considers that a central web-based storage place, such as the JRC Data Collection website, would be most appropriate.

RCG Mediterranean and Black Sea (MED & BS) 2017

Proposed Changes to FDI data call and new data calls	
RCM MED&BS 2017 **Recommendation 2**	The RCG recommends that: - The data call for Fisheries Dependent Information (FDI) should be drafted according to the biological sampling plans implemented in the Mediterranean and Black Sea Region on the basis of WP and RCM recommendations; - To compile relevant tables only with information on volume and value of landings per species and according to the defined level of aggregation. - To clearly state in the official data call that some tables which request data that are not compulsory under the DCF are optional (e.g. provision of data at the GFCM square grid is not compulsory under the DCF). - To allow the use of aggregated codes (e.g. "Appendix 7 Domain definitions" of the field "ALL_GSA" for the Subregion codes, to adjust the data call format to large pelagics sampling protocol), to adjust the data call format to different sampling protocols. - The draft of the new data calls (requirements and format) should be circulated among National Correspondents and RCG chairs before its finalization; - The new data call should be launched at least two months before the deadline for submission of data; - The new data call should be launched in the second semester of the year - The Data calls should consider the timing for data availability agreed at regional level and listed in Table 6A of the MS WP.
Justification	Even if there is a clear need to streamline STECF data calls, this imply a greater effort for answering the additional data call. The FDI data call is not completely clear in terms of requirements and codification. For new data calls it would be useful to circulate a draft among MSs to assure that it can be answered according to the provisions of WP for data collection. The data call cannot be launched in the first semester because in this period MSs have to answer to a lot of other data calls (GFCM, ICCAT, STECF fleet economic, STECF med biological data, RCM MED&BS-LP data call). RCG MED&BS 2017 considered that several issues have been already discussed and agreed at regional levels in terms of: identification of métiers, standard coding for geographical areas, variables, etc. These can be found in RCM Med&BS-LP, RCG Med&BS 2017 and PGMED reports. In addition, a specific deliverable of MARE/2014/19 Med&BS project provides a complete proposal for data format and codification (deliverable 2.4, 2.2-2.7). Position letter with explanations and requests regarding the FDI data call was agreed and send to the COM by the NC present on the RCG Med&BS 2017. For the purpose of future planning of the database adaptations at national level, it is necessary to plan data-call format designs well in

	advance of the announcement of the data-call, in order to allow Member States the time needed to ensure the necessary resources and successfully manage adaptations of national databases.
Follow-up actions needed	Circulation of new and FDI data call among NCs and RCG chairs. Deadlines to be set according to RCG recommendations.
Responsible persons for follow-up actions	DG MARE, JRC, Member States
Time frame (Deadline)	Before the official launch of any new data call and FDI data call in 2018.
STECF comments	STECF supports this recommendation and notes that the EWG 17-12 has already discussed the proposed changes in the FDI data call.
Implementation of the MEDIT and other research surveys at sea	
RCG MED&BS 2017 **Recommendation 3**	RCG recommends Mediterranean MS to carry out the MEDIT survey according to EUMAP provisions. In case of delays due to the MS administrative and bureaucratic procedures implementation, RCG recommends MS to take any actions to perform the MEDIT survey even with a delay with respect to EUMAP provisions. RCG recommends that this also applies to other research surveys at sea. RCG consider that from the scientific point of view it is better to perform the delayed surveys rather to not perform them at all
Justification	According to EUMAP the period for MEDIT survey is spring-summer (2nd and 3rd quarter). However, some MSs, namely Italy and Greece, started the 2017 survey only in September due to administrative delays under the EMFF procedures. The MEDIT will therefore be finalized with some delays with respect to the prescribed timing. - RCG MED&BS agreed on the need to perform the survey, even if with some delays, because: - In the Mediterranean only one survey is covering the demersal species and if no survey is carried out no fisheries independent information will be available - Survey is aimed at collecting biological parameters as well as additional ecosystem indicators that are essential in the assessment of the impact of fisheries on the stocks and ecosystems (the latter also in line with the Marine Strategy Directive Framework) - Surveys data are essential to perform stock assessment and this data can be used even in the case of timing splitting provided that end users are aware of this issue and apply appropriate methodologies for the standardization of the population indices.
Follow-up actions needed	MS to perform the MEDIT and other research surveys at sea within a delay with respect to EUMAP provisions. End users to apply appropriate scientific approaches to mitigate the impact on the reliability and consistency of the data.
Responsible persons for follow-	MS, COM, LM, STECF, End users

up actions	
Time frame (Deadline)	Every year
STECF comments	STECF supports this recommendation and underlines the importance of fisheries-independent data to perform unbiased stock assessment. Ensuring the continuity of the survey time series is essential to monitor trends in biomass.
Merging of length classes	
RCG MED&BS 2017 **Recommendation 4**	The Mediterranean and Black Sea data call issued by the JRC should allow MS to merge the length classes for different métier and should allow the upload of data with merged length classes. For example, for the small-scale fisheries the vessel length classes VL0006 and VL0612 should be accepted to be aggregated into a single vessel length class (VL0012), vessel length classes for trawlers or other fleet segments should be accepted to be recorded as below 24 m and above 24 m, and the code "-1" should be also accepted for allowing MS to submit data aggregated in other ways, in accordance with their national biological sampling designs.
Justification	The RCG Med&BS 2017 group recalled the EU Commission Decision 2016/1251 Chapter III paragraph 2(a) that requests commercial fisheries data to be reported at the aggregation level 6 (corresponding to mesh size). The RCG Med&BS 2017 group, in order to fulfil the requirement of Chapter II (Data Collection Methods) of the EU Decision 2016/1251, reiterated that sampling for the collection of biological data should be statistically planned and designed, so as to avoid problems of under-sampled and non-sampled strata or domains requiring imputation of missing data. The RCG Med&BS 2017 group also took into consideration the requests made by STECF and by the GFCM DCRF in order to merge the different vessel length classes of the LOA for sampling purpose.
Follow-up actions needed	MS to merge vessel length classes. JRC to adapt data call in order to accept merged vessel length classes.
Responsible persons for follow-up actions	LM, JRC, DGMare, MS
Time frame (Deadline)	Before data calls in 2018.
STECF comments	STECF supports this recommendation.
Pilot studies on incidental catch of vulnerable species	
RCG MED&BS 2017 **Recommendation 5**	Following the 2016 Recommendation of the RCM Med&BS-LP on pilot studies for the assessment of incidental catches of birds, mammals, reptiles and fish, the RCG Med&BS recommends MS to follow the planned monitoring programme of the GFCM on the incidental catch of vulnerable species, and carry out the following pilot studies: - 2018: Pilot study for assessing incidental catches of vulnerable

	species from bottom trawlers - 2019: Pilot study for assessing incidental catches of vulnerable species from longlines - 2020: Pilot study for assessing incidental catches of vulnerable species from set nets (gillnets). The guidelines for monitoring incidental catch of vulnerable species and processing the collected data, will be based both on the outputs of the EU MARE/2014/19 project for the Med&BS, and the GFCM guidelines on incidental catch (under preparation). Data to be collected will include: identification of species, number and weight (when possible) of individuals, gear specifications, location and timing of catches.
Justification	It is very important that the implementation of pilot studies on incidental catch is coordinated, in terms of methodology and timing, among Med&BS MS and also the third countries in the region that will perform pilot studies based on the GFCM incidental catch programme.
Follow-up actions needed	LM is expected to provide advice on possible need to update WPs for including information on the implementation of the pilot studies. COM should provide clear guidance on necessity of resubmission of the WPs. COM should inform MS on the LM opinion in due time and in advance of the deadline for resubmitting WPs. Accordingly, MS may have to resubmit their WPs.
Responsible persons for follow-up actions	LM, RCG Med&BS chair, DGMARE, MS
Time frame (Deadline)	After the LM 2017 and before the 31 October 2017
STECF comments	STECF supports this recommendation and suggests that this co-ordinated approach should also be considered in other regions. STECF considers that changes in the relevant Work Plans will be evaluated at EWG 17-13.
Data transmission (DT) failures and involvement of the MS/RCG in the process	
RCG MED&BS 2017 **Recommendation 6**	RCG Med&BS recommends all end users (STECF, JRC and other end-users) that before reporting the DT failures to the COM, to contact the concerned MS to try to clarify the issues and avoid DT failures. RCG recommends to include the analysis and discussion of DT failures in RCG Terms of Reference.
Justification	STECF-17-10, evaluation of DCF 2016 Annual Reports & Data Transmission to end users in 2016, considered that the number of data transmission issues for the Mediterranean data call is very high and considered that the overall process to detect and evaluate DT failures should be streamlined. The dialogue between MS and end users should be improved. STECF suggested to establish an ad-hoc working group within the Mediterranean&BS RCG to deal with data transmission issues. However, RCG considered that the procedure to identify and to assess

	DT failures should follow a step by step process to ensure consistency among end-users and to guarantee a systematic consultation among end users and MSs. RCG considers that it is up to the end user to communicate to MS the issues raised during the use of data and to build a dialogue to detect actual data collection failures excluding all data collection issues that relate to file consistency and/or format/coding requirements. RCGs consider useful to analysis the DT failures in order to identify drawbacks in data collection activities at regional level.
Follow-up actions needed	STECF, JRC and other end-users to communicate DT issues to MS before their submission to the COM and possibly soon after the data validity check. MS should cooperate with end-users to clarify the issues and to give adequate justifications to avoid DT failures.
Responsible persons for follow-up actions	STECF, JRC, other end-users, MS, RCG
Time frame (Deadline)	Soon after the data validity check by an end-user.
STECF comments	STECF supports this recommendation (see ToR 7.3).
Data availability and official data calls.	
RCG MED&BS 2017 Recommendation 7	RCG Med&BS 2017 on the basis of the STECF (2016 evaluation of the WPs) comments, modified and agreed on changed dates in Table 6A. RCG Med&BS 2017 agreed on common dates after which the data sets will be made available to the end users, and requests the relevant MS to refer to these when completing Table 6A – Data availability in their Work Plans. MS and end users are recommended to respect the relevant dates of availability, especially when official data calls are issued by DGMARE and deadlines are set. The agreed and modified Table 6A following the request by the STECF (2016 evaluation of the WPs) on data availability is part of the RCG Med&BS 2017 report. RCG Med&BS 2017 requested many times the JRC/DGMARE on maintaining the stable format of the official data calls, and requests that regional agreements on codes are respected. With regards to the JRC/DGMARE proposal on setting the deadlines of official data calls for the Mediterranean and Black Sea at earlier dates than the current ones, for allowing the associated STECF EWG meetings to convene earlier in the year, the group expressed its concern on the ability of the MS to respect more strict deadlines and on the implications this would have to the quality of the data provided. As an alternative solution, RCG Med&BS recommends DGMARE to shorten the data-handling procedure after the legal deadline of the data calls, for allowing the STECF EWG meetings associated with the data calls to convene no later than one calendar month after the deadline. Specifically, and in line with the data-handling procedure for STECF Expert Working Groups circulated by DGMARE, a two weeks period after the deadline (instead of two months in some cases) should be spent for data checks by JRC, followed by two weeks of operational deadline.

Justification	The regionally agreed availability dates of the different data-sets are based: i.) on the time required for finalizing other related data (e.g. fishing activity data required for finalizing biological data), ii.) the available resources (limited for some MS) for data handling, considering also the timing of DCF reporting obligations, iii.) the required work for processing the data and ensuring their quality for their scientific use. Fixed deadlines of the various official DGMARE data calls should be specified according to the agreed availability dates, for allowing MS to plan in advance the work required for meeting their obligations. The existence of different formats and codes for reporting DCF data through various Data Calls increases the workload of Member States to prepare and provide data according to each data requirement. It increases the risk of not complying with each requested coding and threatens the quality of information provided. Formats and valid codes of a data call may differ from year to year, obliging MS to resubmit the same data provided in previous years in accordance with the updated format and code requirements. By shortening the data-handling procedure after the legal deadline of official DGMARE data calls, STECF EWG meetings associated with the data calls may convene earlier in the year than they currently do, for providing management advice on due time, without setting the deadlines of official data calls for the Mediterranean and Black Sea at earlier dates.
Follow-up actions needed	Follow agreed availability dates by MS and end users. Respect recommendations on the format of data calls
Responsible persons for follow-up actions	MS, JRC/DGMARE, end users
Time frame (Deadline)	Before launch of 2018 data calls.
STECF comments	STECF supports this recommendation.
Shorten the data-handling procedures	
RCG MED&BS - 2017 Recommendation 8	RCG Med&BS 2017 decided to repeat last year recommendation regarding the maintenance of the stable format of the official data calls, and requests that regional agreements on codes are respected. With regards to the JRC/DGMARE proposal on setting the deadlines of official data calls for the Mediterranean and Black Sea at earlier dates than the current ones, for allowing the associated STECF EWG meetings to convene earlier in the year, the group expressed its concern on the ability of the MS to respect more strict deadlines and on the implications this would have to the quality of the data provided. As an alternative solution, RCG Med&BS recommends DGMARE to shorten the data-handling procedure after the legal deadline of the data calls, for allowing the STECF EWG meetings associated with the data calls to convene no later than one calendar month after the deadline. Specifically, and in line with the data-handling procedure for STECF Expert Working Groups circulated by DGMARE, a two weeks period

	after the deadline (instead of two months in some cases) should be spent for data checks by JRC, followed by two weeks of operational deadline.
Justification	The existence of different formats and codes for reporting DCF data through various Data Calls increases the workload of Member States to prepare and provide data according to each data requirement. It increases the risk of not complying with each requested coding and threatens the quality of information provided. Formats and valid codes of a data call may differ from year to year, obliging MS to resubmit the same data provided in previous years in accordance with the updated format and code requirements. By shortening the data-handling procedure after the legal deadline of official DGMARE data calls, STECF EWG meetings associated with the data calls may convene earlier in the year than they currently do, for providing management advice on due time, without setting the deadlines of official data calls for the Mediterranean and Black Sea at earlier dates.
Follow-up actions needed	Respect recommendations on the format of data calls and regarding the shorten data – handling procedures.
Responsible persons for follow-up actions	JRC/DGMARE, end users
Time frame (Deadline)	Before launch of 2018 data calls, especially Mediterranean and Black Sea data call.
STECF comments	STECF supports this recommendation and considers that it is included in the previous recommendation already.
Introduction of new research surveys at sea in the Mediterranean and Black Sea area	
RCM MED&BS 2017 **Recommendation 10**	RCG MED&BS recommend to introduce new surveys at sea in EU MAP Table 10 Research surveys at sea. Proposed new surveys are: - SOLEMON survey for the GSA 17 and - extension of the MEDIAS survey in GSA 11 and 19 Proposed surveys should not affect in any way the implementation of the existing surveys in terms of available resources for surveys at sea (MEDITS and MEDIAS). STECF EWG 17-14 should take in the consideration this recommendation.
Justification	SOLEMON research survey is filling the gap left behind other surveys. Beam trawl used as sampling gear enable appropriate sampling of benthic fish, crustaceans and cephalopods. SOLEMON research survey is the only fishery independent data source for stock assessment of Solea solea and other benthic species in Adriatic Sea. The SOLEMON data are used for stock assessment purposes. Acustic survey for the evaluation of the biomass and spatial distribution of small pelagic fish in the Mediterranean Sea started since the '70s and several research projects of this kind were undertaken at national level. Since 2009 the acoustic surveys of the UE area in the Mediterranean are coordinated by means of a common protocol under

	the umbrella of pan-Mediterranean Acoustic Surveys (MEDIAS). Recently, GFCM has approved and started the Mid Term Strategy aimed at improving already existent surveys in non EU countries or develop new ones where they does not yet exist, possibly with the support of MEDIAS group for what concerns acoustic surveys. The general aim is to expand research surveys at sea in the Mediterranean as much as possible in order to gather the most complete picture that is possible. Anyway, even at UE countries level some gaps in GSAs coverage exist by now. With the aim to try to strengthen coverage in UE area, scientists of CNR-ISMAR of Ancona and scientists from CNR-IAMC of Capo Granitola decided to give their availability to cover by acoustic survey respectively GSA 19 (western Ionian Sea) and GSA 11 (Sardinia), given an adequate financial support, possibly to be added to DCRF in the MEDIAS framework in the future.
Follow-up actions needed	Amendment of the Commission Implementing Decision (EU) 2016/1251, of 12 July 2016, adopting a multiannual Union programme for the collection, management and use of data in the fisheries and aquaculture sectors for the period 2017-2019, (notified under document C(2016) 4329).
Responsible persons for follow-up actions	COM, MS, LM, STECF EWG 17-14
Time frame (Deadline)	Report of the STECF EWG 17-14 (1st trimester of the 2018)
STECF comments	STECF supports this recommendation.

RCG Large Pelagics (LP) 2017

RCG LP shark sampling	
RCG LP 2017 Recommendation 2	Pending a review of the EU MAP, major shark species subject to assessment in tRFMOs, and that are in Table 1D of the EU MAP, should be subject to appropriate sampling even if they are not included in table 1C. This supposes sampling of *Isurus oxyrinchus* and *Lamna nasus* in tuna RFMO areas *. *Except for the Mediterranean where landing of these shark species is prohibited by Recommendation GFCM/36/2012/3 (species listed in Annex II of the SPA/BD Protocol of the Barcelona Convention).
Justification	Both species are priority shark species subject to stock assessment in tRFMOs. Some EU fleets are ranked as the fleets that most contribute to the landings of *Isurus oxyrinchus* in the Indian and Atlantic Oceans (excluding Mediterranean where landing of these shark species is prohibited). On the other hand, ICCAT shark assessment group encouraged MS to implement research and monitoring projects at regional (stock) level in order to close gaps on key biological data for *Lamna nasus*. Thus, as revision of the official EU MAP text is not foreseen in the short term, RCG LP 2017 recommends that major shark species

	subject to assessment in tRFMOs that are in Table 1D of the EU MAP (Shortfin mako and Porbeagle shark) should be subject to appropriate sampling even if they are not included in table 1C.
Follow-up actions needed	Check if any MS should make any amendment to the NWP.
Responsible persons for follow-up actions	MS
Time frame (Deadline)	Before 31 October 2017.
STECF comments	Shortfin mako (*Isurus oxyrinchus*): STECF considers that it is justified to include this species in Table 1C of the EU MAP. Although it is taken as bycatch in the EU longline fleet targeting swordfish/blueshark, it is an important commercial species which is being assessed both in ICCAT, IOTC, WCPFC and IATTC. STECF notes that sampling requirements in ICCAT/IOTC are similar to target species being assessed: nominal catches (Task I), catch and effort and size data (Task II), discard information (from observers) plus biological information (age/maturity/reproduction). ICCAT/IOTC sampling strata is month and by 5º*5º square for the longline fleet. The shortfin mako ICCAT management recommendation 14-06 requests to collect fishery statistics (Task I & II) for this species. STECF further notes that in the Mediterranean Sea, the retention of shortfin mako is forbidden by the Barcelona Convention and GFCM. Thus, tuna and tuna-like fisheries cannot retain this species on board, but observers are also estimating/collecting size information. Porbeagle shark (*Lamna nasus*): STECF considers that it could also be justified to include this species in Table 1C of the EU MAP because it is being assessed in ICCAT/IOTC/Pacific. These groups are requesting to collect fishery statistics data to improve the stock assessment. STECF notes that this species is forbidden to be retained on board for fleets fishing in the Atlantic, Indian and Pacific Oceans. Information on catch/effort, size & sex is mostly collected through observers. Biological sampling, however, is affected by the listing of this species in the CITES Appendix II, which restricts the entrance of biological material from High Seas to national ports (landing sites). Only when biological samples are collected within EU waters, these could be transported within the EU. STECF acknowledges that the RCG LP also made a recommendation/request to the Commission to clarify this point of biological sampling. STECF is aware that the ICCAT recommendation 15-06 requires to promptly release porbeagle sharks alive but also to collect fishery statistics (task I and II) for this species. STECF considers that the EWG 17-13 will take this recommendation into account in terms of checking if relevant MS have listed these species for sampling.

RCG Long Distance Fisheries (LDF) 2017

Data requirements small pelagics CECAF area (From Morocco to Guinea-Bissau)	
RCG LDF 2017 Recommendation 1	RCG LDF recommends again to seek clarification regarding the end-user needs for future scientific advice in the CECAF area for small pelagic species. Currently, no data requirements, neither qualitative, nor quantitative, are specified by CECAF as an end-user. Given the need to address end-user needs, these requirements are a prerequisite for designing an adequate sampling programme at a regional level. The specification of data needs, need to be based upon short/medium term needs and expectations in the light of short/medium term developments and use of assessment models applied as basis for advice. The specification should reflect on data as collected under the previous DCF, especially when requesting new parameters or when setting quality indicators. Also, the requirements should be seen in the regional context and not only apply to the EU fisheries.
Justification	
Follow-up actions needed	DG MARE to liaise with CECAF to seek clarification on data requirements for small pelagics from an end user perspective.
Responsible persons for follow-up actions	DG MARE Unit
Time frame (Deadline)	Given the complex nature of this subject, the follow-up action should start as soon as possible. Data requirements have to be defined prior to the 2018 RCG LDF to ensure the requirements are considered for inclusion in sampling programmes from 2019 onward
STECF comments	STECF notes that this recommendation will be re-considered by a dedicated 2nd RCG LDF 2017 (Copenhagen, 22-23 Nov).
Suspension of EU sampling of small pelagics in CECAF area (From Morocco to Guinea-Bissau)	
RCG LDF 2017 Recommendation 2	Pending the provision of data requirements, RCG LDF concludes that data collection of small pelagics is to be suspended from 2018 onwards until further notice. Pilot studies are not deemed necessary given the successful demonstration of the capabilities to execute a joint EU sampling programme for small pelagics in CECAF area.
Justification	
Follow-up actions needed	MS to suspend activities in the region from 2018 onwards and highlight this in National Workplans.
Responsible persons for follow-up actions	LM
Time frame (Deadline)	1st January 2018

STECF comments	STECF notes that this recommendation will be re-considered by a dedicated 2nd RCG LDF 2017 (Copenhagen, 22-23 Nov).

PGECON 2017

ToR 1 Development of quality assurance framework for DCF data.	
1	PGECON recommends that the reporting on the economic data collection and its resultant quality could be best organized by the following documentation: • Methodological document, including a detailed description of methods of surveys, structured in accordance with the ESS guidelines (Annex 7) and has references to selected ESS QAF Principles (Annex 6) listed in optimized WP Table 5B. This document can be either incorporated in the WP or used as a standalone document of the WP (Annex 8). • Annual Quality report, with tables and specified quality indicators, taking into account the checklist for quality reporting and structured according to the ESS guidelines (Annex 6).
2	PGECON recommends that during the STECF EWG on quality assurance, the collected documentation and developed checklist and outline should be used as a basis for further development of the methodological report and the quality report.
STECF comments	The STECF EWG 17-04 (Copenhagen, 3-7 July 2017; report STECF-17-11) on Quality Assurance for DCF data already discussed and supported these recommendations. In addition, the suggestion on quality reporting according to ESS Quality Assurance Framework (replacement of the table on quality indicators with a more specific checklist of ESS QAF Principles), should be considered in the guidelines for AR (see section 4.4 of this plenary report).
ToR 2 Development of guidelines for social variables data collection in fisheries.	
3	To avoid duplication when fishers are moving from one vessel to another during the year it is recommended that social data should refer to a certain point in time. In cases of use of administrative sources when data is available for all fishers MS should follow Eurostat practice. In case of surveys it is recommended to organise national surveys around the same time of the year to avoid duplication (the same employee working at different boats during the year) and keep stability and comparability of the time series.
4	PGECON recommends to stratify employment data by supra region and major groups of fleets. It is suggested to follow three main AER group definitions as close as possible. However in cases where the link to fishing activity is missing groups based on the size of vessels, e.g. <12m for small scale fleet (SSF), and fishing operation (distant water fleet) might be used.
5	PGECON recommends to follow Eurostat practice and separate social variable "Employment by gender" to the following groups: - "M – male"; - "F – female"; - "Unknown" (only if needed).
6	Taking into account national needs and EU requirements it is recommended to separate social variable "Employment by nationality" to at least the following

	groups: - "National"; - "EU"; - "EEA (non EU)"; - "Other" (Non-EU/EEA).
7	Taking into account needs of EMFF for monitoring of employment by age classes and Eurostat practice, PGECON recommends to separate social variable "Employment by age" at least into the following age classes: - <15; - 15-24; - 25-39; - 40-64; - 65+.
8	PGECON recommends for data collection of social variable "Employment by employment status" to do separation at least between two categories: - "Owner/employer" (vessel owner involved in vessel activity/operation); - "Employee" (all engaged workers on-board, excluding owners).
9	PGECON recommends to use the International Standard Classification of Education (ISCED 2011), defining social variable "Employment by education level". Data collected under EUMAP by MS should allow to provide data at least for the following groups at EU level: - "Low education" levels 0-2 (ISCED2011 and ISCED1997); - "Medium education: levels 3-4 (ISCED2011 and ISCED1997); - "High education" levels 5-8 (ISCED2011), levels 5-6 (ISCED1997).
STECF comment	STECF supports these recommendations.
ToR 5 Presentation of results from Subgroup workshop on Statistical Issues and Methodologies (SIM)	
12	PGECON recommends that variables "Engaged crew", "Personnel costs" and "Value of unpaid labour" from Table 5A of EU MAP, in the guidance should be amended with clarification as follows: "People working only onshore and paid from vessels could be included if their activity has a direct link with the fishing operations".
13	PGECON recommends that variable "Long/short" debt from Table 5A of EU MAP should not necessary to specify and should be amended to "Gross debt".
14	In the guidance of Methodologies for estimation of economic variables for the fleet, concerning the method for estimation "Value of unpaid labour" PGECON recommend to remove the Size Method as it was not appropriate and more specific country orientated.
15	In the guidance of Methodologies for estimation of economic variables for the fleet, concerning value of quota and other fishing rights it was recognized that there were problems raised with the estimation of fishing rights because it is a

	marginal market price, fishers can buy expensive fishing rights on certain circumstances. Therefore estimation methods are hard to generate. PGECON concluded that additional expertise is needed on calculating value of quota and other fishing rights and suggested that the guidance text should be amended as follows: "tradable intangibles could be valued at current market price (or a multi-year average), independently of the question whether they have or have not been acquired or whether they are or not linked to specific tangible (e.g. vessel)".
16	SIM considered that the rules for assigning a vessel to a fleet segment applied so far and explained in EU Decision n. 93/2010 should continue to be applied to ensure consistency among MS and continuity in time series.
17	In segments where assumption concerning the annual working hours per crew member exceed the reference level (the FTE equals 1 per crew member) is not valid, an additional adjustment of the calculation may be required, if it can be expected that the result will be significantly affected (Study No FISH/2005/14).
STECF comment	STECF supports these recommendations. Suggestions for amendments of EU MAP should be recorded and considered by COM when EU MAP will be revised.

STECF conclusions

STECF concludes that all of the above recommendations are to be supported and STECF provides additional input for consideration by the Commission.

STECF concludes its new role in providing advice on the RCG and PGECON recommendations to the Commission would in general be to:

- support RCG initiatives that foster progress in regional cooperation in data collection
- clarify issues based on the STECF expertise and/or dialogue with the relevant Commission bodies (e.g. JRC, DG MARE)
- suggest appropriate responsible fora/institutions for follow-up of the recommendations
- support the information flow between the corresponding parties by active involvement, e.g. by participating in consultations between data collectors and data end-users (see also ToR 6.3)

6. ITEMS /DISCUSSION POINTS FOR PREPARATION OF EWGS AND OTHER STECF WORK

6.1 EWG 17-12 Fisheries Dependent Information – FDI-new

Background provided by the Commission

An STECF Expert Working Group on Fisheries Dependent Information will be convened from 23– 27 October 2017 in Ispra, Italy to review the data transmitted by Member States under the 2017 FDI-new data call (Ares(2017)3288788-30/06/2017) to judge if they are fit to accomplish the following broad aims for the FDI-new database held by the JRC:

i) Compatibility between the FDI-new data and the data held in the Fleet Economic database.

ii) Ability to encompass all EU registered vessels including those from the Mediterranean, Black Sea and external waters fleets.

iii) Ability to assess effects of management measures.

The biological, social and economic impacts of proposed management measures need to be assessed. A long standing limitation on impact assessment has been a lack of inter-operability between the FDI and economic data sets.

Management considerations can concern EU registered vessels in any area of operation. For example it is hoped the first two listed features of the FDI-new database can help to answer questions such as "What is the effect of the EU's contribution (access fees) on the profitability of the EU long-distance vessels fishing under a SFPA (Sustainable Fisheries Partnership Agreement)?"

The Landings Obligation is aimed at achieving reduction of unwanted catches through better targeted fisheries with, for example, improved selectivity. Two key ways to assess the results of management measures under the LO is to consider time series of catch at length information and the amounts of a given stock falling into the different catch fractions now defined under the data collection framework (DCF).

In addition the FDI-new data call has, in the interests of transparency, facilitated the recording of sampled data at the level of aggregation applied in national sampling programmes. There has long been a tension between the relatively fine scale categories by which the Commission require biological information and the, often broader, categories used to raise sampled data. The expert working group is an opportunity to consider and compare approaches taken in populating the more detailed tables.

The objective of the EWG is to assess to what extent the data collected by the new FDI data call and technicalities of the new FDI database fulfil the above mentioned aims by reviewing the data provided as well as the compatibility of the new FDI and Economic databases and by testing the new FDI database via two examples of the potential use of the future FDI database (c-square maps and discard information). The review should list the current shortcomings of the new FDI data call and database; and propose possible ways to find solutions in order to gather the necessary data in the future (e.g. modification of the data call; further work with the Member States; other ways/sources of information than the data call).

Terms of Reference of the EWG 17-12

1 – Review and document feedback from Member States on approaches used and problems encountered in responding to the data call.

1. Report on the level of completeness of data provided in response to the data call.

2. Compile in a concise manner a list of technical problems encountered by Member States in answering the data call and produce a table of any agreed modifications required in the data call for future years.

3. In the interests of establishing common best practices, review and document approaches taken by Member States in answering the data call.

    a. When alternative approaches exist, where possible conclude on the approach to be adopted for the future.

    b. Where a single approach is not considered appropriate/possible clearly state the rationale (or limiting factors) involved.

    c. Particular focus should be given to the relationship between data in Table C (discards at age) and Table A (catch at age); Table E (landings at age) and Table A (catch at age); Table D (discards at length) and Table B (catch at length); Table F (landings at length) and Table B (catch at length).

2 – Test the compatibility between the data collected in the FDI-new database and the data found in the Fleet Economic Performance database.

1. For data from 2015 map fleet segments found in the FDI-new database to fleet segments found in the Fleet Economic Performance database.

2. Compare sums of effort (kWdays-at-sea) and landings (tonnes) between FDI-new and Fleet Economic Performance databases by:

    a. Fleet segment.

    b. Gear type within fleet segment.

3 – 1. Example: Produce maps of spatial effort by c-squares

1. Produce maps of effort by c-square for the following regions (as defined in COM-2016-134 for areas other than 'distant waters') and major gear types (as defined in appendix 4 of the data call):

    a. Baltic; North Sea; North Western Waters; South Western Waters; Mediterranean and Black Sea; Distant waters[1]

    b. Trawls (except beam trawls) with mesh < 100mm; trawls (except beam trawls) with mesh ≥ 100mm; beam trawls with mesh < 120mm; beam trawls

1 Defined here as waters not covered by the previously listed areas

with mesh ≥120mm; seine nets; gillnets and entangling nets; dredges; hooks and lines; surrounding nets; pots and traps.

2. Identify areas within the regions listed in point 1a where the gear categories in point 1b can be sub-divided into categories unique under the Landings Obligation (using SPECON_LO). Produce effort maps by c-square for these sub-categories and compare to the maps for the overall gear type.

3. Identify areas and fleets where spatial data was not available and propose possible ways forward.

4 – 2. Example Discard information by Landings Obligation categories

1. Assess the extent to which discard information has been supplied to categories relevant to and unique under the Landings Obligation, i.e. fleet segments defined through the SPECON_LO field as subject to the landings obligation.

2. Where possible, derive the international discard rate for species linked to the Landings Obligation categories, i.e. species and fleet segment combinations that fall under the landings obligation.

5 – List the shortcomings of the FDI-new data call and database in fulfilling the aims stated in the background section. Advise on possible ways to overcome the shortcomings and to achieve the stated aims.

Request to the STECF

This year the FDI-new data call and database have been piloted. STECF is requested to discuss the results of the EWG 17-12 and make specific recommendations on improvements on the data call and the database, taking into account results of the current exercise.

STECF observations

STECF notes that the EWG 17-12 met in Ispra on 23-27 of October 2017 and addressed all Terms of Reference during the meeting. It had been agreed by STECF Bureau that the report of the meeting will be published separately (as a JRC technical report) and therefore was not available during the STECF plenary meeting, due to time constraints. The following STECF opinion and recommendations are based on the presentation of outcomes from the EWG 17-12 meeting made by the chairperson and subsequent discussion among members during the STECF plenary meeting 17-03. 2 STECF members participated to the EWG 17-12.

The FDI-new data call was launched by DGMARE on 30th June 2017. The data upload facility was opened on 4th September 2017. The operational deadline was set as 9th October 2017 but in the interests in receiving a better representation of what it is possible for MS to upload, data were accepted until 17th October 2017. Also in the interests of assisting MS a 'frequently asked questions' document was posted on the data submission website and updated as new points for clarification became apparent.

STECF notes the legal deadline for data upload (according to the DCF regulation) was 2nd October 2017. Because of the pilot nature of the call DGMARE concluded that data related to this specific exercise would not be subject to an assessment of data transmission failures but MS can take note of the time needed to respond to this year's call to help plan for future calls. Furthermore the data provided during this pilot will not

be publicly available and MS will be invited to resubmit data related to 2015-2016 next year.

ToR1. Review and document feedback from Member States on approaches used and problems encountered in responding to the data call

STECF acknowledges that the FDI-new data call was challenging for the Member States to respond to because it introduced additional complexity and represented an additional workload. The data call specification includes more than 70 pages and there were substantial changes in coding and standard procedures introduced compared to the FDI-classic, which require time to adapt to. Therefore all Member States were requested, in advance to the meeting, to provide their feedback on approaches used and problems encountered responding to the data call.

STECF notes that the EWG reviewed and discussed all comments and feedback received from Member States. The review will help the JRC to develop the new FDI data base and update future data calls. Items of greatest significance were summarised in the presentation to the STECF plenary and are also outlined below. It is proposed that these points will form the text sections within the report of the EWG 17-12 meeting. It is also proposed to incorporate all submissions from the member states, verbatim, in an appendix to that report.

To facilitate a standardised approach to data submission across MS, a table will be sent before the next data call to all MS (both participants of the EWG-17-12 and national correspondents) tabulating which approaches were taken by Member States to complete the fields of the data call. A sample from the table is given in the Fig 6.1.1. Items included to date were drawn from the MS submissions to the EWG. Member States will be invited to add their country code against a description if it matches their own approach or to add a new row giving a new description if their approach is different. The current table is not considered a complete list but rather a way to start the process of better standardisation of data supply in response to future DCF call.

A & B	TOTVALLANDG	The total value of the landings (traded or not through the auctions).	DNK, FRA
A & B	TOTVALLANDG	Calculated exclusively from sales notes.	DNK
		Sales notes not compulsory for all fish sales. Calculated from sales notes when available. Otherwise price is estimated from available sales note data.	FRA
A & B	TOTVALLANDG	**Currency conversion to Euro**	
		Annual average conversion rate used to convert national currency to Euros. This was taken from Eurostat.	SCO
		Not applicable	Euro zone MSs
		Not known	BGR, HRV, POL, ROU, SWE, GBR(not SCO)

Figure 6.1.1. Sample from a table of specific approaches used to complete fields within the FDI-new tables.

ToR2. Test the compatibility between the data collected in the FDI-new database and the data found in the Fleet Economic Performance database

STECF notes that in order to improve compatibility between the data provided to the FDI-new data call and data provided to the Economic data call, additional fields had been added to all FDI-new data submission templates (see Fig. 6.1.2, additional fields highlighted in red). At the same time vessel length categories were updated to make them consistent with vessel length groups defined in the EUMAP.

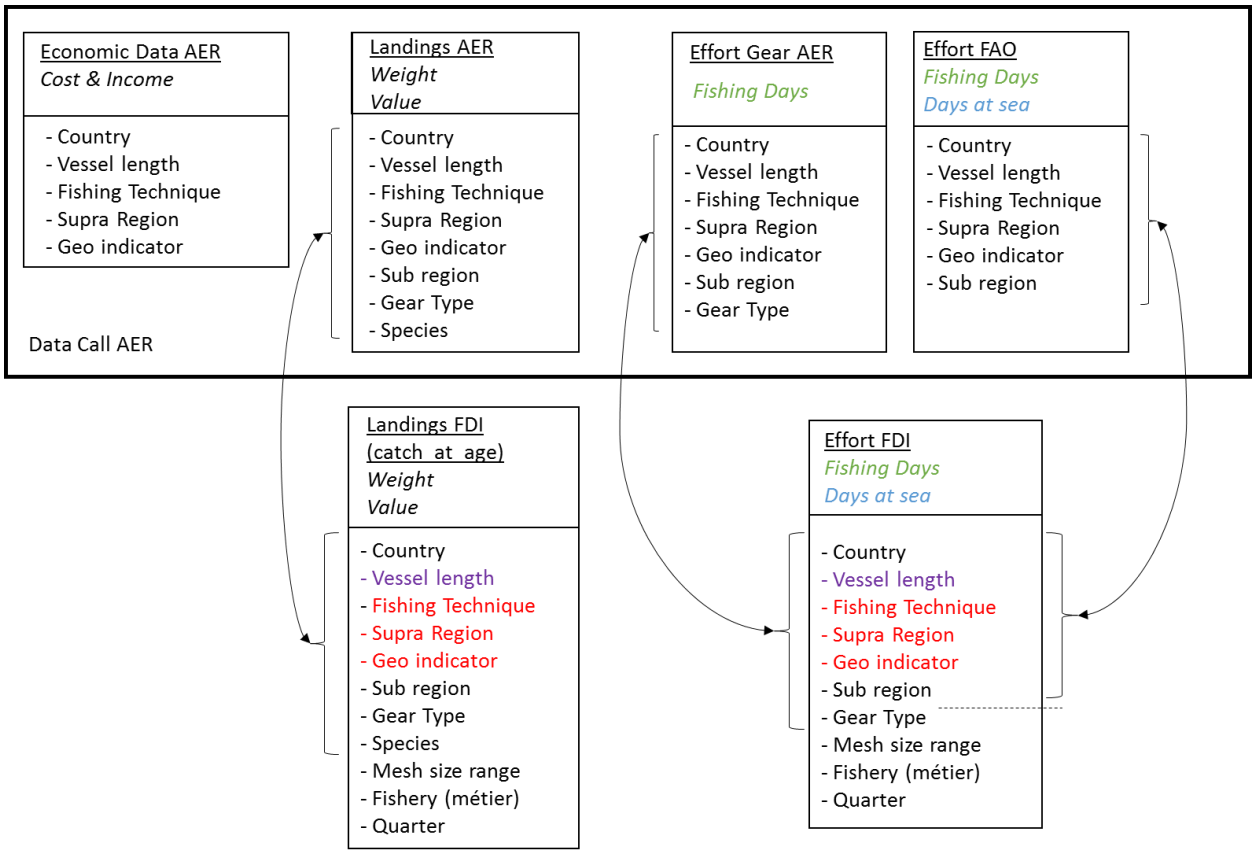

Figure 6.1.2. Compatibility between STECF FDI-new & Economic data sets (annual economic report or AER).

The EWG-17-12 reviewed the data available in both databases (FDI-new and Economic Performance) and concluded there are no outstanding structural issues preventing linking the economic fleet segments with the metier-related biological data and there were no fundamental problems in matching lists of fleet segments between FDI-new and economic data sets found by the EWG. Furthermore the EWG noted that the geo-indicator, used in the economic data call to separate mainland fleets from outermost regions activity, could be applied to remove sub-national country codes (and achieve greater consistency with the economic call) while still allowing countries to maintain sub-national fleet distinctions.

STECF notes that clustering (the grouping of fleet segments when there are too few vessels within the segments which raise data confidentiality problem) needs consideration when matching between FDI-new and economic data sets. STECF notes however that transversal data in the FDI-new will be available at the non-clustered fleet segment level and these fleet segments should be consistent with the economic data set. The clustering of fleet segments is provided in the capacity template of the current economic data call and can be used to map all FDI fleet segments to economic data clusters.

A related consideration is that submissions to FDI-new templates might be a subject for confidentiality concerns by some MS regarding these non-clustered fleet segments. Therefore it was proposed to introduce an additional column allowing MS to flag potential confidentiality issues so these can then be evaluated.

STECF noted that the improved link between databases through fleet segments created additional possibilities for the analysis of fleet segments and will facilitate further improvement of management plans evaluation.

ToR3. Produce maps of spatial effort by c-squares

The previous FDI data call collected landings and effort data by ICES statistical rectangle. The data has proved of benefit to the Commission and other organisations. With the expansion of the scope of the data call to areas beyond the limits of the ICES region a worldwide-compatible method of spatial representation was adopted. The resolution of presentation was decided at 0.5*0.5 degree (c-squares) as this matches the resolution of GFCM squares defined for the Mediterranean and Black Sea and is the closest match possible to the 1.0*0.5 degree rectangles defined by ICES. The means of providing data was not stipulated but it was anticipated logbook data from the ICES area (as used to answer to the old FDI data call) would be employed as well as logbook data recording by GFCM squares.

The EWG concluded that there were further sources of data at a finer scale than FAO sub-area or division level that can be employed (e.g. data supplied to ICCAT at 1.0*1.0 degree resolution). This approach will provide MS with flexibility to provide spatial data and can be accommodated by inclusion of a new column where the resolution of the data is specified. STECF notes that this is a major feature of the new FDI that it can accommodate a wide range of spatial resolutions in the data.

STECF notes that some of the data supplied was derived from VMS data. The concept of a column stating the resolution of the data can be expanded to state both resolution and data source (logbook, VMS or other methodology). Thought needs to be given on whether data from different sources can be presented combined or need to be kept separate when the data is made available to the Commission and more widely. STECF also notes that although the data call simply requests fishing days and tonnes landed there are possibly many methodologies to convert from VMS (combined with logbook) data to the requested information. When such approaches are employed there is a need to try to arrive at consistent approaches.

ToR4. Discard information by Landings Obligation categories

The FDI-new data call requested MS to supply data according to catch fractions, following EUMAP implementing decision EU 2016/1251 adopting a multiannual Union programme for the collection, management and use of data in the fisheries and aquaculture sectors for the period 2017-2019. All MS were asked to separate total catch into components such as the part of the catch landed above the minimum conservation reference size, the part landed below the minimum conservation reference size, the part discarded below the minimum conservation reference size, *de minimis* discards or discards.

STECF notes that receiving specific discards estimates (e.g. *de minimis*) will require both logbook based data as well as directly observed quantities. Within Member States there are potentially conflicting results between logbook and sample data. Moreover, Member States are under pressure, given the potential for such detailed data to be used for compliance checking, to provide data from sources that show compliance with legal amounts.

STECF further notes catch information collected by observers is considered to be more reliable than catch information reported in logbooks by vessel operators. However after 2019 the only legal discards for species managed by quotas and species subject to minimum sizes in the Mediterranean and Black Sea, will be those permitted under *de minimis* and high survivability exemptions. STECF is aware that it is very plausible that

under these circumstances Member States may find it challenging to provide unbiased and reliable discards estimates.

STECF notes thus that the recording of catch is still not fully resolved.

ToR5. List the shortcomings of the new FDI data call and database in fulfilling the aims stated in the background section. Advise on possible ways to overcome the shortcomings and to achieve the stated aims.

STECF notes that there are currently 10 data tables, requested in the data call, 7 of these are: 2 catch tables (referred to in short hand as tables A & B or the 'detailed' tables) and 1 effort table that partitions the EU fleet into categories anticipated to be of interest to the Commission; and 4 tables (2 for discards, 2 for landings, tables C-F) that allow submission of data according to vessel groupings used to raise sampled data to estimate population totals. Tables A & B are linked to tables C-F through a 'DOMAIN' name. MS were then expected to partition discards and numbers at age/length found in a domain into those categories (in tables A & B) contained within the domain.

MS were unwilling to complete the detailed tables in this way. The EWG suggested a partial solution to the issue which allows simplification of the data call. This solution consists of removing all columns in the detailed tables referring to age specific or length specific information. This removal of columns allows the two tables to be reduced to a single table. Member States would still be expected to complete an unwanted catch total within the remaining detailed table. They would be free to choose the criteria used to perform the partitioning. Age profiles and length profiles for landings and unwanted catch by detailed table entry (at the level of metier) would be performed by JRC using profiles from the domain information scaled according to relative landings and relative unwanted catch amounts respectively. This approach would facilitate the harmonisation of the procedure and reduce the burden on the MS during the data submission. STECF endorses this proposal.

STECF notes that the FDI-new data call introduced a field 'SPECON_LO' (specific condition landings obligation) intended to record separately catch fractions by vessel-species combinations subject to exemptions (*de minimis*, high survivability) under the landing obligation. During the LO transition phase, the use, in some cases, of catch thresholds in defining when vessels fall under a given landing obligation (LO) lead to a list of codes that effectively defined every existing LO and with conditions to force exclusive use of a single code. This was considered necessary to prevent double counting of effort and catches but resulted in a) criteria for assigning effort and landings to categories that were difficult to understand and implement b) requiring data in the detailed tables to be even more finely partitioned (see comments on the detailed tables above).

STECF notes that in parallel with recommending the removal of data requests by catch fraction the EWG 17-12 also recommended removal of the SPECON_LO field. It proposed as an alternative the introduction of a column to record target species assemblage (with codes as used in the definition of metiers under the DCF). In this way the EWG felt all the component pieces of data being used to define vessel groups falling under a LO were then included as separate column items. Without explicitly identifying specific LOs during the transition phase the metier categories involved could be split through use of the vessel lists (lists of vessels subject to any given LO) held by the Member States, as outlined in Figure 6.1.3.

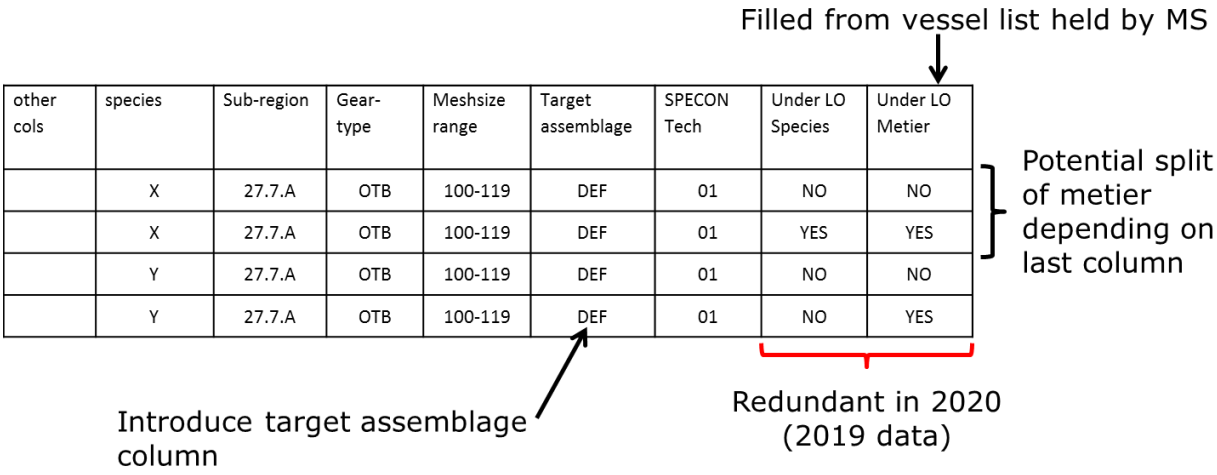

Figure 6.1.3. Proposed fields in FDI-new data call related to the landings obligation.

STECF appreciates the work done on harmonisation of the effort calculation procedures and in particular provision of the R package (fecR) developed as a result of a transversal variables workshop (Ribeiro et al, 2016). The package was available and employed by some MS during the data transmission.

STECF notes that in the future FDI database there might be a clear distinction between data provided by MS and results of estimation of missing data through the database when publishing the data sets. As an example, STECF draws attention to the additional flag in ICES InterCatch database that keeps track of the distinction between discards/unwanted catches that are submitted by Member States ("Imported"), and discards/unwanted catches that are raised subsequently to fill-in the unsampled strata ("Raised"). The interest of making such a distinction might be discussed in the FDI-new forum as well.

STECF recommendations and conclusions

STECF recommends that there should be only one revised FDI-new data call in 2018. This implies that the FDI-classic data call will be discontinued, and the historical data will not be transferred in the new FDI.

STECF concludes that MS should use country codes as used in the economic data call and use geo-indicators to report sub-national data (for UK, Spain, France and Portugal).

STECF concludes that it would be helpful if the JRC would add a confidentiality flag in the next FDI data call to identify information that may raise confidentiality issues and later on discuss the conditions of publication of information with the MS concerned.

STECF agrees with the EWG 17-12 proposal to replace all discard catch fractions – including landings below MCRS – by a single 'unwanted catch' field. MS should make clear instances when they are providing scientific estimates, not official data. STECF notes that assessments of achieving the objectives of the Landing Obligation can still be tracked through analysis of catch profiles.

STECF agrees with the EWG proposal to merge tables A and B into one table removing all columns in the detailed tables referring to age specific or length specific information.

STECF agrees with the EWG to replace SPECON_LO codes with the schema outlined in Figure 6.1.3. STECF endorses this new approach but considers the use of columns

identifying sub-metier categories during the LO transition phase is an unnecessary complication because of the short time scale of the remainder of the LO transition phase before they become redundant.

STECF acknowledge the progress made by MSs and JRC harmonising calculation of the effort variables, derived from the logbooks, and encourages further steps towards harmonising data supply, e.g. VMS data analysis and processing (or other relevant data on the spatial distribution of fishing operations).

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6.2 ToRs of STOCKMED 2

Background provided by the Commission

DG MARE is considering launching, through an EASME framework contract (EASME/EMFF/2016/032 "PROVISION OF SCIENTIFIC ADVICE FOR THE MEDITERRANEAN AND THE BLACK SEAS"), a phase II STOCKMED[2]. The aim is to overcome the data, geographical coverage and methodological limitation of the prior project that hindered a general acceptance of the proposed stock boundaries. STECF is request to advise MARE on which would be key additions in terms of data, on adequacy of the STOCKMED methods and upon potential improvements. Additionally STECF should advise on which should be the key species for which stock boundaries should be resolved.

MARE, based on prior advice from STECF and GFCM, potentially envisions the following future steps:

- a geographical expansion to Southern Mediterranean countries as well as the Black Sea
- extensive genetic sampling for a number of key species
- testing the proposals of stock boundaries in terms of available data and feasibility of multi-GSA stock assessments.

Request to the STECF

The STECF is asked to evaluate, on the basis of the STOCKMED I project scope, methods and results:

1. Advise on the adequacy and robustness of the analytical approach taken in STOCKMED 1. Identify if better methods are available, also in light of a potentially improved availability of genetic sampling and expansion of the historical data following the launch of a fisheries data recovery project under EASME FWC in 2017[3].
2. Identify a subset of key species on which STOCKMED II should focus.
3. Advice on the most adequate genetic sampling protocols for key species, number of sampling locations, numbers of samples per species and number of samplings in time if needed.

4. evaluated in terms of data collection and processing, stock assessment and management advice. On the basis of these prior considerations, STECF PLEN 17-03 should outline a methodological framework:
5. STECF 14-03 suggested that new stock unit's configuration should be checked against productivity as for example k, density, Lmax, natural mortality rates and

2 https://ec.europa.eu/fisheries/documentation/studies/stockmed_en

3 This project aims at recovering historical trawl surveys and compositional data from all the Mediterranean and Black Sea.

other features. STECF also considered that the consequences of the new stock configuration need to be evaluated in terms of data collection and processing, stock assessment and management advice.
On the basis of these prior considerations, STECF PLEN 17-03 should outline a methodological framework:

a. for validating the results of proposed GSA clustering
b. for evaluating the stock assessment feasibility at the proposed aggregated GSA level in terms of data availability and the impact on data collection, assessment and management advice.

STECF response

Review of Background information collected and compiled by STECF

STECF has gathered a number of documents relevant for STOCKMED and STOCKMED II.

STOCKMED Feedback GFCM WG|SAD 2015

Mr Fabio Fiorentino, from the Istituto per l'Ambiente Marino Costiero del Consiglio Nazionale delle Ricerche (IAMC-CNR), presented the Results of the StockMed Project. StockMed was a European-funded project tackling the identification of stock units and their boundaries for 19 species of commercial interest in the Mediterranean. The study was based on available data concerning all those domains that are recognized in the literature as determinant for multidimensional identification of stocks. Since these data derive from studies carried out for several different purposes (e.g. analysis of growth, maturity, spatial distribution, etc.), it was necessary to develop an appropriate methodology that allowed for data standardization and analysis. The developed methodology has allowed devising a framework that combines spatial analysis (constrained clustering) and Multi-Criteria Decision Analysis (MCDA), incorporating geo-referred indicators derived from biological, environmental and fishery information. Despite the difficulties of integrating in a rigorous analytical procedure different types of information, the methodology developed allowed to identify possible geographical stock configurations for most of the investigated species, including the assessment of their uncertainty. These configurations represented the first example of distribution of stock units in the Mediterranean according to a holistic and standardized approach and based on the current knowledge available, to be validated through specific studies or the collection of supplementary/independent information. Although with some differences in species, results suggested that most of the existing GSAs should be aggregated for assessment purposes according to a longitudinal gradient.

WGSAD participants welcomed the results of the StockMed project and highlighted the importance of addressing the definition of stock boundaries in order to improve the assessment of stock status. They agreed that shortcomings did exist when using GSAs as stock boundaries; however, the group also highlighted that further information would be needed in order to define other stock boundaries. Participants also stressed the need to incorporate data from southern areas, especially for those areas where the boundaries between northern and southern Mediterranean stocks are not clear, such as the Alboran Sea, the Strait of Sicily and the Eastern Mediterranean. In this respect, it was mentioned that relevant information on these areas was already available and could be readily incorporated, while a plan to obtain further information when required should be designed. Based on the discussion, participants requested further work be done on the issue, presented and discussed in future meetings of the WGSAs.

STOCKMED Feedback STECF PLEN 14-03

STECF recognizes the huge effort made by STOCKMED and considers the used methods are in principle suitable for the identification of clusters and also suitable for integrating different types of available information (survey data, genetics, parasites etc.). Although, all available data were used in the project, there are still a number of data deficiencies that should be considered. Relevant data for defining stocks such as tagging and genetic data were very scarce or not available for most of the species. Furthermore, available data on fisheries, in particular on the spatial distribution of fishing effort and fleets were very scant and unsuitable for the purposes of the project. The same problems found regarding the Mediterranean also apply for the Black Sea as also in this area relevant information is partial or almost absent.

ToR2
STECF is not able to compare the validity and robustness of the stock units proposed under the STOCKMED project with the existing GFCM-GSAs limitations. However, STECF consider, the new stock unit's configuration should be checked against the major requirements for stock assessment, i.e. productivity and population isolation (i.e. self-sustained sub-populations with no major migration and immigration among neighbouring units and with separate spawning areas). While the latter cannot be checked due to lack of data, the second can be roughly done through the analysis of differences between the old and new stock configuration in productivity as for example k, density, Lmax, natural mortality rates and other features. STECF also considers that the consequences of the new stock configuration need to be evaluated in terms of data collection and processing, stock assessment and management advice. STECF consider that these aspects need further consideration before final conclusions about a new stock configuration can be made and that this would be best advanced through a dedicated expert group
The same types of data problems found regarding the Mediterranean are also applicable for the Black Sea as also in this area relevant information is partial or almost absent. Until such data issues are resolved, STECF considers that the current definition of a single GSA should be maintained.

STECF feedback from EWG 17-07

***ToR 3** - STECF notes that the proposed ad-hoc contracts to evaluate appropriate species areas considered in ToR 3 were not placed. Given the limited information available (STOCKMED report and a few additional published papers collected during the meeting), STECF agrees with the EWG conclusion that the basis for many stock divisions is weak. STECF is not aware of currently ongoing projects dealing with stock identity, and acknowledges that unless more data become available, population boundaries will remain uncertain. STECF recalls that the STOCKMED project (which finished in 2014) that aimed at the definition of stocks units in the Mediterranean was not conclusive due to a generalized lack of evidence on some aspects useful for stock discrimination such as larval dispersal, connectivity, genetics, and also in detailed fisheries activities as spatial distribution of the fleets (STECF PLEN 17-01). STECF considers that the proposed stock boundaries (Section 2.1.3 of the EWG report) should be used for current assessments and management until better options become available.*

Regarding the request to provide pros and cons of the geographical scope of each possible MAP, STECF notes that the main issue, the stocks configuration, remains uncertain. There is hardly any new information on stock boundaries existing in addition to that collected during the STOCKMED project. In order to advance knowledge on stock boundaries, it is necessary to initiate new data collection (such as tagging, genetic etc.) that can generate new information on stock identity and distribution.

STECF observations

In the Mediterranean, stock assessments have been conducted within arbitrary spatial boundaries (the so-called GSAs) However, the Mediterranean populations will likely be spatially structured at scales distinct from those arbitrarily defined.

STECF considers that the inability to account for correct spatial structure can lead to errors or uncertainty in the knowledge of the status of the single stocks and may drive to local depletions. The European project STOCKMED was carried out "to investigate the presence of distinct biological units (stock units) for some target species in different GFCM-GSAs reviewing and integrating the available information through a multi-disciplinary approach". STOCKMED new definitions of stock boundaries were used in successive EWGs on stock assessment in the Mediterranean. In many cases, STOCKMED suggested fairly wide areas where the same stock unit was present, and new stock assessments were conducted at much wider scales than in the past.

However, during subsequent expert working groups, concerns were raised on the reliability of the proposals for GSAs fusions for many stocks and also on the possible consequences of the use of such new results related to management advice.

As regards the MARE proposals, based on prior advice from STECF and GFCM, that potentially envisions the following future steps:

1. a geographical expansion to Southern Mediterranean countries as well as the Black Sea
2. extensive genetic sampling for a number of key species
3. testing the proposals of stock boundaries in terms of available data and feasibility of multi-GSA stock assessments.

STECF agrees with the scope proposed in these three points, and discussed the following:

Wrt. 1), STECF highlight the needs for increasing the coverage of species distribution area especially for the non-EU southern areas of Alboran Sea, Sicily straits and towards the East Mediterranean as stock boundaries for many stocks may go beyond the areas covered by the STOCKMED I. For example additional information is needed for the Black Sea and Marmara Sea, where concerns are raised on the turbot stock identity in particular

Wrt. 2) STECF agree that available genetic information is very limited and genetic data collection for a representative number of key species should be included in the new project. Modern genetic techniques allow the identification of phylogeographic patterns which are relevant for population management and conservation. Molecular genetics data can now be collected very easily and analysed with a fast and simple procedures and with a moderate cost once the appropriate markers have been identified. However, STECF considers that the genetic information alone may be not conclusive and is advisable its integration with other lines of evidence, such as meristics and morphometrics, knowledge on the existence of physical and orographic barriers, mark and recapture experiments, life-history characteristics, otolith microchemistry, parasites, etc. following state-of-the-art stock identification methods (Cadrin et al., 2013)

Wrt.3) Regarding the validation of results on stock boundaries, other than the methods used in the STOCKMED project, STECF notes that there have been proposed many other approaches based on simulations that can be potentially useful for exploring the

uncertainty of assessment outputs associated with alternative models defined at different spatial scales or assumed population structure (ICES, 2011). Such approaches allow estimations on the effects that the scale of management has on sustainability (e.g., Punt and Methot, 2004; Cope and Punt, 2011;Kerr et al., 2016).

These studies use simulation testing to offer quantitative evaluations of spatial stock structure assumptions on the performance of stock assessments relative to alternative management scales.

The STECF is asked to evaluate, on the basis of the STOCKMED I project scope, methods and results:

1. Advise on the adequacy and robustness of the analytical approach taken in STOCKMED 1. Identify if better methods are available, also in light of a potentially improved availability of genetic sampling and expansion of the historical data following the launch of a fisheries data recovery project under EASME FWC in 2017.

STECF reviewed STOCKMED I in STECF PLEN 14-03 and reiterates that the approach used by STOCKMED I can be considered suitable. The choice of the used methods, however were conditioned by the available data. The study analysed data from already existing information collected with different objectives, and characterised by an incomplete coverage regarding the descriptors of different nature that were used in the analyses. STOCKMED I did not collect any new data but analysed the limited existing data and information found in literature.

STOCKMED II is about collecting new data, so it is important to have a correct and well defined methodological design from the beginning. STECF notes that there is a full body of literature dealing with stock ID, in many other fisheries regions. State of the art methodologies include a combination of methods and data sources (including e.g. genetic, tagging, otoliths shape and microstructures, chemical markers, surveys, drift modelling, etc; Cadrin et al., 2013), and the use of experience gained in other areas is therefore of major importance to design an appropriate sampling design to collect new data.

STECF states that large-scale tagging and recapture of fish is widely used as it provides estimates of movements, stock structure, growth, mortality, age specific selectivity and population size, making it one of the most powerful methods for deriving information needed for fisheries management. Tagging data can be incorporated directly into contemporary integrated stock assessment models (i.e. Maunder 1998, 2001, 2004; Hampton and Fournier 2001; Bentley et al. 2001; Besbeas et al 2002; Polacheck and Eveson 2006), and provide estimates of biological processes which are of high relevance for fisheries assessment and management strategies.

It is worth noting that modern tagging is generally coupled with genetic sampling, which gives among the most valuable set of information for inferring stock structure of exploited fish populations. Thus, STECF consider that any future STOCKMED initiative should focus on developing a long-term coupled tagging-genetic sampling program in the Mediterranean and Black Sea. The program should cover the relevant target species and areas.

STECF is not able to provide a review of the state of the art methodologies within the frame of the plenary, and emphasizes that such a review will have to be performed while designing the project.

STECF suggests that a dedicated workshop could be convened inviting some external experts from e.g. US and Northern Europe to plan the data collection accurately.

2. Identify a subset of key species on which STOCKMED II should focus.

GFCM and STECF Mediterranean EWG have prepared priority lists based on commercial importance and conservation needs.

The species identified in STOCKMED I are among the most important species in the Mediterranean and can be candidates for the new STOCKMED II. In some cases, available information was too poor to allow even a preliminary hypothesis of stock units. STOCKMED II should consider the main gaps of knowledge identified by STOCKMED I, also review which species drives the management plans. Also, analyses performed in subsequent assessment EWG have shown that some assessments may be more sensitive to stock ID assumptions than others, and this should be taken into account as well.

3. Advice on the most adequate genetic sampling protocols for key species, number of sampling locations, numbers of samples per species and number of samplings in time if needed.

STECF considers that is not in a position to address the preparation of a detailed sampling protocol and methodology for collecting tissue material for genetic studies during the plenary. This should be done within the frame of the early planning for data collection, also taking into account the scientific expertise available.

4. STECF 14-03 suggested that new stock unit's configuration should be checked against productivity as for example k, density, Lmax, natural mortality rates and other features.

STECF endorses such suggestion but warns on the real message that can arrive from the analysis of many of such features. Some circular information can be found (k can only be estimated as soon as the stock boundaries are defined, M is in the area estimated with empirical methods based on growth parameters) and differences found in these parameters might be not real but due to methodological issues. STECF notes also that differences in productivity can also occur because of differences in fishing pressure rather than differences in stock ID.

STECF conclusions

STECF considers that it is of high priority to continue the efforts aimed at a better knowledge on stock units and their boundaries and encourages the launch of a phase II STOCKMED through an EASME framework contract. Such a study has been requested for a long time.

Before STOCKMED II is launched, a thorough planning of sampling program is required, based on state of the art methodologies in stock ID both for each methodology alone but also in combination of data sources.

More concrete planning would be best tackled through an expert group meeting before launching the project, with the participation of external experts in the fields.

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6.3 DCF

Request to the STECF

Under this point the Commission wishes to discuss the involvement of STECF as end-users at the Regional Coordination Groups, how to improve the end-user feedback of the STECF EWGs to the Commission on data failures as well as how to involve experts in DCF evaluation who are external to the on-going process i.e. they are not involved in drafting MS reports.

STECF response

Involvement of STECF as end-users at the Regional Coordination Groups

According to article 9 of EU Reg. 1004/2017, representatives of relevant end-users of scientific data, regional fisheries management organisations, Advisory Councils and third countries shall be invited to attend the meetings of the regional coordination groups as observers, where necessary. Activities and functioning of RCGs are regulated by the internal rules of procedures of each RCG.

STECF and its EWGs when using the data to provide scientific advice may identify issues and data requirements that should be considered by RCGs in drafting regional work plans and in coordinating regional data collection activities.

STECF proposes that each EWG should clearly report data issues and data requirements. Every year, in the summer plenary, STECF should compile a list of all relevant recommendations to be addressed by RCGs, which annual meetings usually take place in September, and by PGECON for the social and economic issues.

This procedure will guarantee that inputs from STECF are not dispersed but actually taken into account by RCGs and PGECON.

How to improve the end-user feedback of the STECF EWGs to the Commission on data failures

This issue has been already discussed in PLEN-17-02, where a step by step procedures was suggested to identify data failures (Figure 4.5.1. Process for identification and assessment of DT failures, page 46, STECF 17-02 report). STECF reiterates the conclusion that it is the responsibility of each STECF EWG, making use of data received through an official data call, to report DT issues.

Once DT issues have been identified, a consultation process should be established with MS to address them. To facilitate this process, STECF considers that for data issues raised by EWGs, a 'real-time' approach could be established using a web-based tool. Issues raised by users on receipt of the data could be posted on the web app, MS receive an automatic notification that an issue has been raised and can respond on the same application also in 'real-time'. User can then decide whether the issue has been resolved. Any unresolved issues are then left open on the web-app and are then reported as an issue or failure with a comment from the user on the impact on the issue on their ability to carry out the work required. STECF considers that the existing data transmission issues and failures tool on the DCF website (Tab-Compliance) may be a good point to start the development of the web-app.

To further improve the end-user feedback of the STECF EWGs and other end users, STECF also agrees with the suggestion from the 2017 Liaison Meeting to establish a "data end user group". This group could be an extension of the present Liaison Meeting. Such extended LM, composed by end users (including STECF) and chairs of RCGs, together with the Commission, will address issues like improvement of communication and establishment of common references for standard information. Setting up this subgroup will also facilitate the role of the RCG to support end users.

How to involve experts in DCF evaluation who are external to the on-going process i.e. they are not involved in drafting MS reports.

STECF considers useful the involvement of a broader group of experts in the DCF process. This can be achieved by sending an announcement with the TORs and timing of relevant EWGs to the chairs of ICES WGs, GFCM/SAC meetings, fisheries economists' forum (like PGECON or EAFE). In addition, the invitation could be extended to also include experts from outside the EU.

The expertise to be invited should be tailored to the tasks STECF is expected to address. In particular and according to DCF regulation, STECF tasks are:

1. Evaluation of work plans

STECF role is to assess whether what MS propose in their WPs meet users' requirements. Therefore, users of scientific data should take part in the STECF EWG that assesses WPs.

STECF EWG on evaluation of WP should also be attended by experts on sampling design and survey implementation to evaluate the soundness of the methods applied, transparency in protocols and optimisation of sampling programmes.

2. Evaluation of Annual Reports

    2.a Conformity of ARs with WPs

Conformity evaluation is moving towards automation (see TOR 5.4, EWG 17-17). This will hopefully reduce the burden on the STECF EWG and the STECF assessment of ARs should be a list of observations and recommendations.

    2.b Quality of the data collected

Quality aspects with regard to the accuracy and precision of data are not addressed in a quantitative manner (such as having a CV on the estimates). Rather, following considerations on Quality Assurance Framework, as defined in STECF-17-11 (Quality Assurance for DCF data), the AR template is being adjusted to report better on the overall quality of the achieved sampling program, e.g. through indications on achieved coverage, refusal rate etc. Therefore, STECF EWG on evaluation of Annual Reports need also attendance of experts on sampling design that can evaluate whether any such deviation from the WPs due to e.g. sampling being not performed or increased refusal rate can potentially lead to some changes in the coverage and bias in the estimated variables.

6.4 Food from Ocean report

Request to the STECF

The report will be presented to STECF. Based on the presentation, STECF is requested to discuss and provide feedback to DG MARE.

Background

Commissioner Vella, on behalf of the European Commission College, has requested scientific advice from the Commission's Scientific Advice Mechanism (SAM) High Level Group of Scientific Advisors (HLG) in the area of food and biomass from the oceans, in order to inform preparation for the successor to the present European Maritime and Fisheries Fund and on-going development of the overall maritime affairs policy portfolio. The HLG provides the Commission with independent scientific advice on specific policy issues where such advice is critical to the development of Union policies or legislation. The advice will be based on the best possible scientific evidence.

The SAM unit of DGRTD presented the findings of the Food from the Oceans (FFO) report. The first step of producing a Scientific Opinion by the HLG was drafting an evidence review report, which was prepared by international working groups of the Science Advice for Policy by European Academies (SAPEA) consortium. SAPEA works within the SAM and work is carried out by the five European academy networks (Academia Europaea, ALLEA, EASAC, Euro-CASE, and FEAM). The overall objective of the project is to collate timely, independent and evidence-based scientific expertise from more than 100 European academies from over 40 countries for the highest policy level in Europe and for the wider public. Two independent working groups of 22 experts gathered and summarised the evidence on the question of "how to sustainably harvest more food from the ocean". The working groups covered a range of fields in the natural sciences, social sciences and the humanities.

On 14 September 2017 a workshop was held to obtain expert assessment of the feasibility, cost and scaling implications of the evidence, possibilities and options outlined in the SAPEA evidence review report. The views of 14 invited experts were presented from the applied business, policy and citizen perspectives. They were discussed with a group of ten of the lead authors of the evidence review report. The aim was to help the HLG identify possible scientific evidence-based recommendations for its Scientific Opinion on the subject.

The draft HLG opinion on food from our oceans was presented and discussed in plenary in the STECF meeting. Based on the presentation, STECF is requested to discuss and provide feedback to DG MARE on the main findings.

The main areas the opinion covers are the quantification of harvest potential, cross-cutting issues, mariculture, wild capture and management and governance. The five significant areas of the high level opinion focus on mainstreaming "food from the oceans" into global and systems-level policy agendas, integrated planning, assessment and informed decision making for a vibrant mariculture sector, sustaining wild-capture - ensuring implementation and enforcement of existing regulations and use of best practice, facilitating policy change and future-proofing policy and extending knowledge.

STECF response

The recommendations from the Scientific Advisory Mechanism High Level Group's (HLG) Food from Oceans (FFO) initiative were presented to the STECF during the plenary session. However, STECF has not had the opportunity to consult the SAPEA evidence review report, on which the recommendations of the HLG are based. In addition, the Committee was not permitted to retain a copy of the presentation, which limited the opportunity for any in-depth discussion on which to base constructive, informed feedback.

STECF welcomes the initiative to have had this report presented during plenary. However, it is regrettable that the STECF was not consulted to provide input to the FFO initiative at an earlier stage in the process, for example to provide feedback on the SAPEA evidence review report before the HLG recommendations were formulated based on the evidence in that report.

STECF notes that the recommendations presented to the Committee largely reflect the core objectives of the Common Fisheries Policy (CFP). Many recommendations presented under the headings of vibrant mariculture, sustaining wild-capture, facilitating policy change, future-proofing policy and extending knowledge are already being implemented, or have already been attempted.

STECF would have welcomed a longer-term outlook. The challenges of the future, such as the UN Sustainability Development Goals' 2030 Agenda and the 2050 challenge of providing a world population of close to 10 billion people with food, safe drinking water and sustainable energy require a foresight-oriented process with a far-reaching vision. In this regards, STECF stresses the importance of ensuring the ecological sustainability of ecosystems, highlighting the need to prioritise the second part of the FFO title aiming at "not depriving future generations of oceans' benefits".

STECF notes also that with a focus on global and systems-level policy agendas and integrated planning it could be useful to consider the wider context, placing the production of food in relation to the other competing uses of oceans.

STECF could participate in future discussions on wider scientific and policy issues, should some of the issues mentioned above be discussed further with the SAM High-Level Group.

6.5 SCAR Bio-economy policy brief

Request to the STECF

The report will be presented to STECF. Based on the presentation, STECF is requested to discuss and provide feedback to DG MARE.

STECF response

STECF was asked to discuss the policy brief on the future of the European Bioeconomy Strategy coming from the Bioeconomy Strategy Working Group of the Standing Committee for Agricultural Research (SCAR).

Three presentations were presented to the STECF by a representative of the Bioeconomy Strategy Working Group of SCAR and discussed in plenary. The first one explaining the SCAR history and composition, the second one specifying the role of the Bioeconomy Strategy Working Group, and a third one describing the policy brief on the future of the European Bioeconomy Strategy.

STECF notes that the policy brief on the future of the European Bioeconomy Strategy is recommending a broader definition of what is meant by "Bioeconomy Strategy". By revising the definition, it is intended to make the different interpretations by EU and member states compatible. A second objective of this revision is to extend the definition of bioeconomy by including ecosystem services to the already product based definition.

STECF notes that the policy brief also suggests that the differences between the terms 'bioeconomy', 'bio-based economy', and 'blue growth/economy' are to be clearly defined in order to avoid confusion.

STECF notes that bioeconomy is traditionally focused on the methods for converting raw material into value added products, while the bio-based economy focuses on the raw material itself rather than the conversion processes. It is also noted that the EU definition of bioeconomy is based on the use of renewable biological resources from land and sea.

STECF notes that fisheries, aquaculture and fish-processing are by definition part of the bio-based economy (biomass based). However, they are primary affected by other strategies and regulations somehow related to the Bioeconomy Strategy itself, such as the Europe 2020 Strategy for smart, sustainable and inclusive growth (included in the Common Fisheries Policy), the Blue Growth Strategy, the Marine Strategy Framework Directive and the Maritime Spatial Planning Directive.

STECF notes that it is for the first time asked to discuss this strategy, and that the policy brief does not provide any recommendation specifically related to fisheries.

STECF concludes that a common understanding of the bioeconomy strategy between EU and member states will facilitate the evaluation and monitoring of the effects of it, in particular with regards to sustainable fisheries management. STECF would like to offer its expertise and assistance to SCARFish, the committee of SCAR in charge of discussing fisheries' issues. In addition, STECF would like to accentuate the necessity of including relevant experts and expertise in SCAR and SCARFish undertakings such as Strategic Policy Advice and the Foresight Process. Relevant input on fisheries and the wider range of maritime activities and their operations in the marine environment is strongly advocated. STECF notes that for example, in the last foresight exercise Sustainable Agriculture, Forestry and Fisheries in the Bioeconomy, no fisheries expertise was included

in the core team. STECF offers its full support to source relevant experts to be included in such processes in order to ensure that fisheries are fully incorporated.

6.6 CFP monitoring-Ecosystem indicators

Request to the STECF

STECF is requested to consider which indicators may be useful for future reporting on wider ecosystem objectives of EU legislation and directives and to identify how this may be best achieved

STECF comments

The ecosystem requirements of the CFP

Preliminary discussions with DG-MARE and DG-ENV representatives, informed by a presentation on Good Environmental Status (GES) criteria and reporting under the Marine Strategy Framework Directive (MSFD) delivered by DG-ENV at the opening of the STECF plenary, allowed specifying the aim of the Commission request. STECF is invited to make any appropriate comments and useful recommendations, in order to expand the CFP monitoring, currently based on stocks status, to a wider ecosystem approach. Thus, STECF is requested to suggest the best way to build a reporting system, regularly informing the Commission and political bodies on the progress made in fisheries management to achieve the CFP objectives related to marine ecosystems.

The EU Basic Regulation (Regulation 1380/2013 of the European Parliament and of the Council of 11 December 2013) stipulates, in Article 2 devoted to the definition of the general CFP objectives, that *"The CFP shall implement the ecosystem-based approach[4] to fisheries management so as to ensure that negative impacts of fishing activities on the marine ecosystem are minimised, and shall endeavour to ensure that aquaculture and fisheries activities avoid the degradation of the marine environment"* (Art. 2.3).

More specifically, the basic regulation stipulates that the reduction in the ecosystem impact of fisheries may be achieved by: incentives, including those of an economic nature, such as fishing opportunities, to promote fishing methods that contribute to more selective fishing, to the avoidance and reduction, as far as possible, of unwanted catches, and to fishing with low impact on the marine ecosystem and fishery resources (Art.7.1.d); pilot projects on alternative types of fishing management techniques and on gears that increase selectivity or that minimise the negative impact of fishing activities on the marine environment (Art. 7.1.h); specific measures to minimise the negative impact of fishing activities on marine biodiversity and marine ecosystems, including measures to avoid and reduce, as far as possible, unwanted catches (Art.7.2.e), the

4 The Regulation (Art. 4.9 on definitions) defines the 'ecosystem-based approach to fisheries management' as *an integrated approach to managing fisheries within ecologically meaningful boundaries which seeks to manage the use of natural resources, taking account of fishing and other human activities, while preserving both the biological wealth and the biological processes necessary to safeguard the composition, structure and functioning of the habitats of the ecosystem affected, by taking into account the knowledge and uncertainties regarding biotic, abiotic and human components of ecosystems*;

establishment of protected areas due to their biological sensitivity, in which fishing activities may be restricted or prohibited in order to contribute to the conservation of living aquatic resources and marine ecosystems (Art. 8.1), and the adoption – within multiannual plans – of specific conservation measures based on the ecosystem approach (Art. 9.5).

The regulation also stipulates that MS should provide data enable the assessment of the impact that fishing activities have on the marine ecosystems (Art. 25.1), and that the Commission should regularly report to the European Parliament and to the Council on protected areas established within the CFP for the conservation of marine ecosystems (Art. 8.3).

Therefore, STECF notes that a reporting system on the CFP performances in achieving its ecosystems objectives should include indicators able to measure the reduction in the fishing impacts on the European marine ecosystems. According to Article 8.3, this reporting system could include the monitoring of the measures adopted to this aim, for instance with regards to the establishment of biologically sensitive protected areas.

The CFP in the context of the MSFD

The Marine Strategy Framework Directive (MSFD), adopted by the EU in 2009 (Directive 2008/56/EC of 17 June 2008 establishing a framework for community action in the field of marine environmental policy) forms the environmental pillar of the EU Integrated Maritime Policy. It is the thematic strategy for the protection and conservation of the marine environment, and has the overall aim of 'promoting sustainable use of the seas and conserving marine ecosystems', with the goal of achieving good environmental status (GES) across all European waters by 2020. The role of the MSFD in defining environmental objectives for fisheries policy is clearly stated in the MSFD; the legislation states that it 'should contribute to coherence between different policies and foster the integration of environmental concerns into other polices, such as the Common Fisheries Policy'. The Directive identified 11 Descriptors that provide more specific statements of desired environmental status, of which 5 are directly impacted by fishing activities: the biodiversity, the stock status of exploited species, the good functioning of the food webs, the sea-floor integrity, and the amount of marine litter.

In developing marine strategies, the Directive requires Member States (MS) to follow Art. 5.2 of the MSFD, including the preparation of an in initial assessment and the definition of GES and appropriate targets and indicators by 2012, the establishment of monitoring programmes by 2014, the development (by 2015) and implementation (by 2016) of programmes of measures designed to achieve or maintain GES by 2020 (Art. 11 and 13 MSFD). The MSFD includes provisions for a six-year review of the different elements of the strategy, with the next phase being 2018-2021. The development of indicators and related targets and thresholds is on-going at both national and regional levels with the involvement of organisations such as for example ICES[5] and OSPAR[6].

5 http://www.ices.dk/explore-us/Action%20Areas/Pages/Marine-Strategy-Framework-Directive-(MSFD).aspx

6 https://www.ospar.org/work-areas/cross-cutting-issues/msfd

A review of the first phase of implementation of the MSFD by the European Commission carried out in 2014 (COM(2014) 97 final) revealed that MS determined GES sub-optimally, leading to an incoherent and inconsistent implementation of the MSFD. This was followed by two years of technical reviews, leading to the new Commission Decision of 17 May 2017 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment, which repealed Decision 2010/477/EU. Table 6.6.1 below shows the MSFD descriptors of GES impacted by fisheries activities, and related criteria based on this Commission Decision (EU) 2017/848.

Table 6.6.1. MSFD descriptors of the good environmental status impacted by fisheries activities and related criteria based on Commission Decision (EU) 2017.

N°	Descriptor	Related criteria
1	**Biodiversity**	. D1C1: Mortality rate per species (birds, mammals, reptiles and non-commercial fish or cephalopods) from incidental bycatch (It should be below levels which threaten the species)
3	**Commercial fish & shellfish**	. D3C1: Fishing mortality rate (at or below Fmsy) . D3C2: Spawning stock biomass (above Bmsy) . D3C3: Age and size distribution of individuals (indicative of a healthy population)
4	**Marine food webs**	. D4C1: Diversity of the trophic guild (species composition and abundance) . D4C2: Balance of total abundance between the trophic guilds . D4C3: Size distribution of individuals across the trophic guild . D4C4: Productivity of the trophic guild
6	**Sea-floor integrity**	. D6C1: Spatial extent and distribution of physical loss of seabed . D6C2: Spatial extent and distribution of physical disturbance . D6C3: Spatial extent of each habitat type which is adversely affected by physical disturbance . D6C4: Proportion of the natural extent of each habitat type lost . D6C5: Proportion of the natural extent of each habitat type adversely affected by anthropogenic pressures (including losses)
10	**Marine litter**	. D10C1. The composition, amount and spatial distribution of litter on the coastline, in the surface layer of the water column, and on the seabed (at levels that do not cause harm to the coastal and marine environment) . D10C3. The amount of litter and micro-litter ingested by marine animals (at levels that do not adversely affect the health of the species concerned) . D10C4. The number of individuals of each species which are adversely affected due to litter, such as by entanglement, other types of injury or mortality, or health effects.

With regards to reporting on wider ecosystem objectives of EU legislation and monitoring the ecosystem impacts of fishing in the context of the MSFD, STECF notes the following key points:

- Although the MSFD process is cyclical, the different elements of the strategy are only reviewed every six-year, and as such there is no regular (e.g. annual or biannual) monitoring of indicator status.
- Efforts to assess GES at regional level are ongoing, but this process is not yet operational for all MSFD regions / sub-regions. Indeed the 2014 Commission review concluded that: '*Member States' definition of good environmental status and the path they set out to achieve it shows overall limited ambition, often fails to take into account existing obligations and standards and lacks coherence across the Union, even between neighbouring countries within the same marine region*'. Thus aggregate information at regional level is not readily available for all European sea basins.
- Many GES assessment criteria are state metrics (for instance of biodiversity, food webs, integrity of sea-floor communities), rather than pressure indicators. Managing on the basis of state indicators can be challenging, especially where long lag periods are expected between a change in pressures as a result of management interventions implemented under the CFP and a response in 'state'.
- Some aspects of ecosystem impacts of fishing activities are not covered under the MSFD, for instance there are no criteria specifically dedicated to the impacts of fishing discards.
- A focussed set of indicators sensitive to fishing pressures and able to capture the most important impacts of fishing on the marine environment are more suitable than indicators which are responsive to a variety of combined anthropogenic activities (e.g. monitoring all physical disturbances on the seafloor vs. monitoring physical disturbances from fishing).
- Wherever possible it is preferable to use indicators on fishing impacts which can be calculated routinely with currently collected data.

STECF thus concludes that the MSFD process does not directly provide the information required to report on the wider ecosystem objectives of the CFP, and that a regular monitoring process which specifically focusses on fisheries impacts at a regional level is required.

Previous approaches developed by STECF

The previous fisheries Data Collection Framework (DCF; Council Regulation (EC) No 199/2008 and EC Decision 2008/949/EC) included the obligation for MS to provide the data required for the computation of 9 pressure and state environmental indicators designed to measure the effects of fisheries on the marine ecosystem (Table 6.6.2). STECF notes that these indicators were fisheries oriented, and covered a wide range of ecosystem impacts of fisheries, from threatened species to genetic aspects, fishing pressure on the sea floor, discards, and fuel consumption.

These indicators were not included in the new EU-MAP (Commission Implementing Decision (EU) 2016/1251 of 12 July 2016 adopting a multiannual Union programme for the collection, management and use of data in the fisheries and aquaculture sectors for the period 2017-2019) since it was considered that (i) indicators on marine ecosystem status are included in MSFD legislation, and (ii) fisheries data collection legislation should focus exclusively on the collection of data, not on the computation of indicators

Table 6.6.2. List of ecosystem indicators defined in the previous DCF, defined during an *ad hoc* meeting of independent experts on (Brussels, 25-27 June 2007), and subsequently listed in Appendix 8 of Commission Decision 2010/93 EU.

N°	Indicator	Type	Definition
1	**Conservation status of fish species**	State	Indicator of biodiversity to be used for synthesizing, assessing and reporting trends in the biodiversity of vulnerable fish species
2	**Proportion of large fish (LFI)**	State	Indicator for the proportion of large fish by weight in the assemblage, reflecting the size structure and life history composition of the fish community.
3	**Mean maximum length of fishes (MML)**	State	Indicator for the life history composition of the fish community
4	**Size at maturation of exploited fish**	State	Indicator of the potential "genetic effects" on a population
5	**Distribution of fishing activities**	Pressure	Indicator of the spatial extent of fishing activity. It would be reported in conjunction with the indicator for 'Aggregation of fishing activity'.
6	**Aggregation of fishing activities**	Pressure	Indicator of the extent to which fishing activity is aggregated. It would be reported in conjunction with the indicator for 'Distribution of fishing activity'.
7	**Areas not impacted by mobile bottom gears**	Pressure	Indicator of the area of seabed that has not been impacted by mobile bottom fishing gears in the last year. It responds to changes in the distribution of bottom fishing activity resulting from catch or effort controls, technical measures (including MPA establishment) and to the development of any other human activities that displace fishing activity (e.g. wind farms).
8	**Discarding rates of commercially exploited species**	Pressure	Indicator of the rate of discarding of commercially exploited species in relation to landings.
9	**Fuel efficiency of fish capture**	Pressure	Indicator of the relationship between fuel consumption and the value of landed catch. It will provide information on trends in the fuel efficiency of different fisheries.

In order to progress with the implementation of the ecosystem-based approach to fisheries management (EAFM) several expert working groups were convened under the

auspices of ICES (e.g. ICES, 2013)[7] and STECF (2010; 2012)[8]. EWG 11-13 (STECF, 2012) undertook analyses based on European regional marine ecosystems (Table 6.6.3), and included an assessment of trends under the following categories; i. total landings and effort, ii. synthesis of the stock status and stock trends, iii. ecosystem and environmental indicators, and iv. fleet based synthesis (integration of economic and ecological indicators). More specifically, the indicators considered by the group were: total landings Y, fishing effort E, mean fishing mortality F, total stock spawning biomass SSB, mean recruitment index R, index of mean sustainable fishing mortality F*, large fish indicator from surveys LFI, mean maximum length MMLw from surveys or from landings, and mean trophic level MTL from surveys or from landings. Based on the report of its EWG 11-13 STECF had recommended that a revised DCF should include a requirement to collect data to estimate the values of state and pressure indicators to contribute to the requirements of an EAFM and the MSFD.

Table 6.6.3. Location and scale of European marine ecosystems used in the analysis implemented by STECF EWG 11-13, together with an indication of the location and spatial extent of RAC areas and MSFD regions (STECF, 2012).

	Ecosystem	**FAO Subdivisions**	**Relevant RAC**	**MSFD Region**
1	Baltic sea	ICES IIIb, 22-32	Baltic Sea	Baltic sea
2	North sea	ICES IVa-c, IIIa, VIId	North Sea (except VIId)	North sea
3	West Scot./Irel.	ICES VIa-b, VIIb-c	North western waters	North sea / Celtic sea
4	Irish sea	ICES VIIa	North western waters	Celtic sea
5	Celtic sea	ICES VIIe-k	North western waters	Celtic sea
6	Bay of Biscay	ICES VIIIabd	South western waters	Bay.Bisc. & Iberian .C
7	Iberian coast	ICES VIIIc, IXa	South western waters	Bay.Bisc. & Iberian .C
8	Azores	ICES X	South western waters	Atlantic ocean
9	Canarias, Madeira	CECAF 1.2	South western waters	Atlantic ocean
10	Western Med.Sea	GFCM 1.1, 1.2 & 1.3	Mediterranean Sea	Western Med. Sea

7 ICES (2013). Report of the Workshop on DCF Indicators, 21 - 25 October 2013, ICES Headquarters, Copenhagen, Denmark. ICES CM 2013/ACOM:38. 81 pp.

8 STECF (2010). Report of the SGMOS-10-03 Working Group Development of the Ecosystem Approach to Fisheries Management (EAFM) in European seas, 6-10 September, Rennes, France. 146 pp. & STECF (2012). Development of the Ecosystem Approach to Fisheries Management (EAFM) n European seas (STECF-12-12). JRC 73147, EUR 25415 EN, ISBN 978-92-79-25675-2, ISSN 1831-9424, doi:10.2788/38873. 177 pp.

		(GSA 1-12)		
11	Adriatic Sea	GFCM 2.1 (GSA 17-18)	Mediterranean Sea	Adriatic Sea
12	Central Med.Sea	GFCM 2.2 (GSA 13-16, 19-21)	Mediterranean Sea	Ionian sea
13	Eastern Med.Sea	GFCM 3.1, 3.2 & 4.1 (GSA 22-28)	Mediterranean Sea	Aegean-Levantine Sea
14	Black Sea	GFCM 4.2 (GSA 29)	- none -	Black Sea

STECF notes that indicators listed in the previous DCF / considered in previous STECF working groups did not consider litter from fishing activities. STECF (2012) specifies that this approach was chosen because it considered that (i) litter was being discarded from all kinds of ships in general and thus under the remit of MARPOL (International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978), and that (ii) a review of ghost fishing in European waters concluded that ghost fishing accounted for less than 1% of the total mortality caused by fishing operations (not including discard mortality) (Brown & Macfadyen 2007). STECF however considers that based on more recently available information (for example: Bo et al., 2014; Buhl-Mortensen and Buhl-Mortensen, 2017; Cau et al., 2017) it is now known that fishing litter is having considerable impacts on ecosystems also in the deep-sea, and as such should be included in future reporting on wider ecosystem objectives of EU legislation and directives. Indeed possible actions to manage litter from fishing operations could also be considered in the revision of the control regulation (EC) 1224/2009 as a mean to increase synergies with environmental legislation.

STECF (2012) calculated fleet-based indicators to compare ecological impacts and socio-economic performances of major fleet segments operating within each of the seven considered ecosystems, based on a suite of 13 indicators. STECF notes that the overarching aim of the revised CFP is to ensure that fishing is environmentally, economically and socially sustainable; the goal is to optimise economic activity while seeking to minimise the impact on the relevant ecosystem. Since various levels of fishing effort and the use of different fishing patterns (metiers) may lead to the same profitability but have different ecosystem impacts, it follows that a precautionary approach may require the selection of the fishing regimes which minimize ecosystem impacts whilst optimising socio-economic performance.

STECF conclusions

A specific monitoring of the ecosystem impact of fisheries is needed. As much as possible indicators should be compatible with the MSFD, but fisheries specific complimentary indicators, including relevant fishing pressure indicators, should be added where required.

Future reporting on wider ecosystem objectives of EU legislation and directives should be carried out at the level of appropriate regional marine ecosystems and at regular intervals.

An expert working group should be convened in 2018 in order to address topic. Experts could be asked to:

1. Define a list of fisheries specific indicators. Experts could base this list on a review of ecosystem indicators included in the previous DCF, indicators calculated by previous STECF EWGs, and where relevant fisheries specific indicators used or recommended by ICES / OSPAR / RFMOs etc. (e.g. GFCM-DCRF Subtask VII.7 on 'Ecosystem Indicators'). STECF suggests a few approaches in Table 6.6.4 that could be used as a starting point.
2. Test the feasibility of computing (or aggregating if already published) a first list of ecosystem indicators. The EWG would need to have access to both fisheries dependent and fisheries independent data from the databases available in e.g. JRC and ICES for this exercise (see details on 'data required' in Table 6.6.4 below).
3. Where necessary identify gaps in data provided by MS allowing for an assessment of fishing activity impacts on marine ecosystems, as required by Art. 25.1 of the CFP. In particular information provided in the proposed Tables 1F on incidental by-catch / 1F(a) on impacts of fisheries on marine ecosystems in MS Annual Reports (see TOR 5.4) should be considered when identifying missing variables, besides data from fisheries data calls and other relevant sources of information.
4. Identify major fleet segments operating in different European marine ecosystems (based on considerations of catch weights / values), and discuss the feasibility of calculating fleet-based ecosystem indicators.
5. Propose an appropriate and timely reporting process to STECF plenary.

Table 6.6.4. Candidate list of fisheries-oriented ecosystem indicators, required data sources, related MSFD descriptors, and an indication whether the indicator has previously been calculated by STECF EWGs tasked with advancing the EAFM.

Candidate indicator	Data required	Related MSFD descriptor	Previously calculated by STECF EWG?
Conservation status of fish species	Species, length and abundance from fisheries-independent research survey(s) for relevant marine region. Lists of vulnerable fish species (e.g. IUCN Red Lists; species lists of relevant international conventions)	D1	No
Catches of endangered, threatened or protected species	Catch data for relevant marine region. Lists of vulnerable, endangered or threatened species (e.g. IUCN Red Lists; species lists of relevant international conventions).	D1	No
Large fish indicator	Species, length and abundance from fisheries-independent research survey(s) for relevant marine region.	D1, D3, D4	Yes
Mean maximum length of fishes	Species, length and abundance from fisheries-independent research survey(s) for relevant marine region;	D1	Yes

	Fishbase.		
Size at maturation of exploited fish	Individual measurements of age, length, sex and maturity from fisheries-independent research survey(s) for relevant marine region.	D1	No
Distribution of fishing activities	Vessel position records based on VMS / AIS or other monitoring systems with minimal intervals of 2h.	D1, D6	No
Aggregation of fishing activities	Vessel position records based on VMS / AIS or other monitoring systems with minimal intervals of 2h.	D6	No
Areas not impacted by mobile bottom gears	Vessel position records based on VMS / AIS or other monitoring systems with minimal intervals of 2h.	D6	No
Impacts of bottom fishing on VMEs	Vessel position records based on VMS / AIS or other monitoring systems with minimal intervals of 2h. Maps of VME distribution.	D6, but specific to fisheries	No
Discarding rates of commercial species	Data on discards from logbooks, onboard observations, last haul analysis.	Specific to fisheries	Yes
Fuel efficiency of fish capture	Value of landings and cost of fuel.	Specific to fisheries	Yes
Mean trophic level	Catch and survey data for relevant marine region; Fishbase.	D4	Yes
Fishing litter	Data on presence of fishing litter from surveys (e.g. voluntary protocol to recorded marine litter in MEDITS); data from scientific literature.	D10, but specific to fisheries	No

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7. STECF RECOMMENDATIONS FROM STECF-PLEN-17-03

STECF concludes that the guidelines on balance indicators (COM (2014) 545 Final) should be revised in line with previous advice, taking into account concerns and proposals in previous EWG reports [STECF-15-02, STECF-15-15] and Annex 1 of the report by EWG 16-09. This revision would enable scientific expertise to be better employed to assist the Commission and Member States in meeting their obligations under Article 22 of the CFP (Regulation (EU) No 1380/2013).

STECF notes that the EWG 17-09 stressed an urgent need to re-evaluate age assignment for the assessment for anchovy in GSA 17-18, particularly for the surveys. STECF recommends that future work is carried out to adopt a common otolith reading protocol and perform an intercalibration of age reading.

STECF PLEN 17-03 considers that specific monitoring of the ecosystem impacts of fisheries is needed in order to report on the wider ecosystem objectives of EU legislation and directives. STECF therefore recommends that an Expert Working Group tasked with identifying how this may best be achieved is convened in 2018.

8. BACKGROUND DOCUMENTS

Background documents are published on the meeting's web site on: https://stecf.jrc.ec.europa.eu/plen1703

9. CONTACT DETAILS OF STECF MEMBERS AND OTHER PARTICIPANTS

1 - Information on STECF members and invited experts' affiliations is displayed for information only. In any case, Members of the STECF, invited experts, and JRC experts shall act independently. 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 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: http://stecf.jrc.ec.europa.eu/adm-declarations

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The Scientific, Technical and Economic Committee for Fisheries (STECF) has been established by the European Commission. The STECF is being consulted at regular intervals on matters pertaining to the conservation and management of living aquatic resources, including biological, economic, environmental, social and technical considerations.

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