JRC SCIENCE FOR POLICY REPORT

SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES – 68th PLENARY REPORT (PLEN-21-03)

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EUR 28359 EN

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JRC127688

EUR 28359 EN

PDF	ISBN 978-92-76-45527-1	ISSN 1831-9424	doi:10.2760/622806

STECF	ISSN 2467-0715

Luxembourg: Publications Office of the European Union, 2021

How to cite this report: Scientific, Technical and Economic Committee for Fisheries (STECF) – 68th Plenary Report (PLEN-21-03). EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2021, ISBN 978-92-76-45527-1, doi:10.2760/622806, JRC127688.

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 held its 68th plenary as virtual meeting from 15 to 19 November 2021.

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68th PLENARY REPORT OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (PLEN-21-03)

Virtual Meeting

15-19 November 2021

1. INTRODUCTION

The STECF hold its autumn plenary as virtual meeting on 15-19 November 2021 with STECF members addressing the ToRs from their home offices.

2. LIST OF PARTICIPANTS

The meeting was attended by 31 members of the STECF, one invited expert, and five JRC personnel. Several Directorate General Maritime Affairs and Fisheries (DG MARE) attended parts of the meeting. Section eight of this report provides a detailed participant list with contact details. The STECF members Leyla Knittweiss, Thomas Catchpole, and Barry O'Neill were unable to attend the meeting.

3. INFORMATION TO THE PLENARY

STECF early 2022 meetings

The STECF EWG-21-14: Economic Report on the fish processing industry is scheduled for 21-25 Febraury 2022.

The STECF spring 2022 is scheduled for 21-25 March 2022.

Call for the new STECF

The three years term of the current STECF will end in June 2022. The Commission launched a call for application for the new STECF with application dealine 25 November 2021.

4. STECF INITIATIVES

No STECF initiatives were discussed during the meeting.

5. ASSESSMENT OF STECF EWG REPORTS

5.1 EWG 21-04 MSE Adriatic small pelagics

Request to the STECF

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

STECF observations

The STECF EWG-21-04 was held virtually from 12 to 16 July 2021. The meeting was attended by 10 experts, including fish dynamic modelling and economic expertise. Among them there were two STECF members and three JRC experts, but no observers.

The EWG-21-04 was tasked to develop and test alternative harvest control rules (HCR) for anchovy and sardine in the Adriatic Sea (GSA 17+18) based on the latest GFCM Benchmark (ended in January 2021), that will ensure a low probability of SSB to fall below Blim (P<5% probability). This should be done through Management Strategy Evaluation framework (MSE).

The EWG-21-04 had the following ToRs:

ToR1

TOR 1) Conditioning / background for simulation testing:

1.1 Model an intermediate period 2020-23 in line with the work performed for STECF 1802: Using anchovy and sardine reported catches from 2020, assuming status quo catches in 2021 (in line with the Council Fishing Opportunities Regulation 2021) and according to different levels of catch reductions of Sardine (of 5-10-15% per year) and Anchovy (of 5-10-15% per year) starting in January 2022 and ending in December 2023. As a sensitivity run, for year 2024, sardine catches should be 15% lower and anchovy 5% lower than the level of 2023.

1.2 Condition operating models for Sardine and Anchovy in the Adriatic Sea (Gsa 17-18) with the results of Request for services - 1743 - STECF Ad hoc contract and taking into account the current GFCM benchmarked stock assessment and adding stock-recruitment models that consider multi-annual cycles of recruitment, which can consider both biomass or non biomass related drivers for recruitment in the past. Specifically for the sardine stock, due account should be given to the uncertainty in the growth in recent years. Additionally model recruitment: In line with S/R in model conditioning or segmented-regression, S/R variance set in accordance with literature, occurrence of Persistent low recruitment or other deemed appropriate

1.3 Use an age structured population model based on a single area and a calendar year basis (January to December)

TOR 2) In the MSE follow the specifications below:

2.1 Full feedback loop or shortcut MSE: For Anchovy stock run MSE with full feedback loop. For Sardine stock, owing to the stock not being benchmarked and survey CVs being too wide, run only a shortcut MSE to understand the impact of the transitional period measures on the SSB and Rec.

2.2 Implementation Model: Annual catch limits to be set over for the January – December period. Management implementation via catch control

2.3 Observation Model: The MSE testing should simulate the provision of scientific advice where the data delivery of echo-survey (performed June-Sept) and landings from Year N in April of year N+1, stock assessment performed in June (N+1) and catch quota implementation from January N+21 .

2.4 Management Decisions

2.4.1. The objective of the management decisions is to reach the plan target [Fmsy proxy or SSBtarg] in year : a) 2025 b) 2028

2.4.2. From January 2024 annual catch limits/TACs should be set on the basis of HCRs outlined below. Additionally, as a sensitivity run, simulate the HCR implementation starting in January 2025 after catch levels established in point 1.b.

(HCR1) Test a level of fixed level F proxy (e.g. through catches)

(HCR2) Test a fixed biomass HCR in line with the Bay of Biscay anchovy or in an ICES like HCR.

(HCR3) In line with the work of STECF EWG 18-01, update the biomass escapement HCR that will ensure a low probability of SSB to fall below Blim (5% probability) for Anchovy and Sardine.

For the HCR3, define: an optimal level of the Bescapement, confirm the need of an Fcap and in case the appropriate level.

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1 Note that in the report the notation of years is not the one in the TOR but the following: The assessment and advice is produced in year y (the interim or assessment year), using data from surveys until year y-1, and for the management of year y+1.

2.4.3. In combination of the HCR 1-3 test the effect of a TAC stability mechanism that allows TAC inter-annual change of 10% downward and 5% upward. Advise if such mechanism is compatible with achieving the plan target according to point 2.4.1.b

TOR 3) Economic Performance.

If economic data are available and of adequate quality, evaluate the maximum economic performance of the HCR.

TOR 4) Performance Statistics

Evaluate performance of alternate scenarios (at least 250 iterations) on 10-20 year time scale using standard MSE diagnostic tools, in line with those developed for STECF EWG 1801, focusing in particular on the following in relation to Harvest Rate:

Probability of SSB falling below Blim. / Risk of SSB falling below Blim vs Catch level / Catch variability / Average catch / Level of SSB / and any other deemed useful and of simple interpretation

TOR 5) Consider possible additional scenarios stemming from GFCM SAC discussion.

The preliminary report (STECF-Adhoc-21-02) was presented to the SAC but no suggestions came from the SAC

STECF comments

STECF considers that the EWG addressed all the ToRs satisfactorily, and acknowledges the high quantity and quality of the work performed both before and during the EWG meeting. The EWG was prepared in advance during the first half of 2021 by setting up the management simulations framework, and running some preliminary explorations of the harvest control rules. The preparatory work was carried out by the JRC team and was evaluated by STECF (STECF-Adhoc-21-02).

ToR1 Conditioning/background for simulation testing

Intermediate period 2020-2023

EWG-21-04 conditioned the intermediate period as requested (2020-2023) conditional to the prescribed reduction of catches, assessing the expected biomass trajectories and risks of

falling below Blim until 2023, and, as a sensitivity test, also up to 2024 subject to the additional reduction of catches in 2024 of 15% for sardine and 5% of anchovy (TOR 1.1).

The simulation results evidenced that the probability of the sardine biomass being below Blim would be far above 5% in any year, and would increase significantly from 2020 to 2023. For anchovy the situation would not be as dramatic, as median biomass would tend to increase. However, the risks of falling below Blim for any of the three prescribed gradual reduction of catches until 2023 will remain above 5%. The additional reductions proposed for 2024 were also tested and the results showed similar trends for both stocks. All these results were shown through graphs of trajectories of Catch, SSB, F and recruitments along time, and by box plots summarising performance indicators by selected time periods.

A feature of the prescribed fixed catch reductions over the intermediate period is the inability to adjust catch levels to the stock biomass levels. This increases risks for the biomass if occasional major drops in recruitments would occur in the coming years. The iterations that simulate such sharp decreasing trajectories do end up in fisheries closure in the early stages of the subsequent HCR implementation in 2024. This explains the high risk levels throughout these intermediate years, given the poor starting conditions of the two stocks. STECF endorses the suggestions passed to managers (in the Executive summary) on setting up some extraordinary circumstances for management actions if the monitoring system detects severe deteriorations of the stock status of sardine or anchovy throughout the intermediate period, in order to prevent stock collapse.

Operating Models

The Operating models (OM) to run the MSE of the different HCRs were defined according to GFCM benchmarked assessment for anchovy (SAM) and preferred assessment model for sardine (A4A) from latest GFCM Benchmarking process (ended in January 2021, GFCM, 2021) (TOR 1.2). These were age structure models with natural mortality, growth (van Bertalanffy model) and maturity by ages and survey inputs taken as relative indexes. The best fitted Stock Recruitment models were adopted for the two species (according to the AIC), i.e. Beverton-Holt (BH) model for anchovy and segmented regression for sardine. The only deviation from the OM's settings directly resulting from the assessments were that the variance estimates around the S-R relationships were judged to be too small for the two stocks in comparison with literature; therefore the adopted residual variance was set at the mode of the predictive distribution for σ_R generated using the hierarchical taxonomic life history model FishLife (Thorson 2020). Such deviation is well justified in the report.

STECF notes that the requirements in TOR 1.2 of considering multi-annual cycles of recruitment was discarded because recruits deviations from the fitted SR models were found to be uncorrelated. The others requirements to be tested, such as recruitment failures, or any other variant of the OM deemed necessary, were included in the framework of a robustness test of the HCRs to alternative OM/Simulations.

The alternatives considered for this robustness test were:

- Natural Mortality: Constant natural mortality for all age classes (= 0.9) (vs. the base case of changing by age).
- Recruitment failure (LowRec) corresponds to a forcing for three consecutive years (from 2028 to 2030) of a 35% reduction of the expected recruitment from the BH-SR relationship (by application of 0.65 multiplier).
- Increased recruitment variability around the SRR (hiVar), passing from the modal (base case) to the mean variability (higher value) of recruitment (σ_R)

according to the life history model FishLife around expectations to the BH-SRR, i.e. adopting the mean σ_R= 0.49 – value arising from the hierarchical multivariate model FishLife (Thorson, 2020).

- Autocorrelation within recruitment (ar1Rec); such value was set to 0.456 based on the estimate of ρ = 0.456 by Thorson et al. (2014).

STECF acknowledges that these alternative configurations of the OM correspond to main variants suspected to affect small pelagics in general and give a major support to verify the robustness of the harvest controls rules (Siple et al. 2017; 2020; Thorson 2020).

Biological Reference points Blim and Bpa and Fmsy were adopted from the GCFM benchmark for the two stocks. However, for anchovy, the Fmsy used for the tuning of the HCRs was the one deduced from BH-SRR (0.96), which was slightly higher than the GFCM benchmark defined Fmsy (0.81 with Patterson's criteria). Such a deviation was required to increase the inner consistency between the OM while testing the HCR within MSE, so that resulting Fishing Mortalities for every HCR can be compared with the Fmsy of the OM.

ToR2 HCRs definition and tuning & TOR 4 Performance Statistics

The setting up of a management strategy evaluation framework (MSE) (TOR 2.1), required developing ad hoc R scripts in particular for the full MSE loop for anchovy which included the yearly update of observed input data (including catches and surveys) and of the assessment (SAM) in the projection period of simulations. For sardine, the 'short-cut' approach passed the 'true' age-structured dynamics from the Operating Model (OM) and it was only used to assess the impact of the transitional period measures on the SSB and Recruitment. STECF acknowledges the extensive work for developing these scripts carried out by the JRC team.

As requested (TOR 2.2) Management implementation for the two stocks was simulated via catch control (TAC) set over for the January – December period.

Assessment – management time lag

STECF notes that the prescribed management procedure (TOR 2.3) follows a standard time lag, where the TACs for the management year (Y+1) are set according to an advice (based on the HCRs) from an assessment carried out in the interim year (Y) on data inputs catches and echo-surveys (performed June-Sept) up to the previous year (Y-1). This implies a two years lag between the data input (Y-1) and the management (Y+1). This scheduling of the advice process is commonly applied by management bodies worldwide, and has recently been adopted by GFCM for these two stocks. STECF acknowledges that this represents an improvement over the former practices which involved a three years time lag.

Nevertheless, STECF emphasises that although this being standard practice, a two years lag for short lived species still implies that a large fraction of the population used to inform the HCRs could have already died by the management year, whereby TAC will be obtained from a mostly renewed population (SSB Y+1 being mostly composed of age 1 entirely unknown and age 2 poorly known from the inputs for the advice). Hence, robust improvements of the management procedure could be obtained by shortening further the lag between the input

data for the assessment and the management implementation. Since for short lived species the shorter this lag is the less uncertainties are in the advice, such reduction of the time lag can ultimately lead to some gains in catch opportunities in the long term. For example, these benefits have been shown for the Bay of Biscay anchovy management procedure, which uses the information of the catches and surveys in the interim year (Y) to provide the advice for the management of the following year (Y+1) (STECF 2014; Sanchez et al. 2019).

The performance statistics were those defined in TOR 4, plus a few new ones: Level of SSB relative to Bmsy, level of F relative to Fmsy and Prob(Closure). The Performance Statistics were evaluated across 1000 stochastic iterations over three-time horizons of projections after the intermediate period: short term (2022-2025), medium term (2022-2028) and long term (2032-2044). Time series of median values by indicators and box plots for selected periods of time, in addition to tables, were used to present the results.

The harvest control rules (HCR) applicable to the anchovy stock were as defined in TOR 2.4: Fixed target fishing mortality (fixedF), Biomass Escapement (Besc) and "Bay of Biscay type" (BoB). The parameters of the three HCRs were sought through a tuning procedure, first by selecting the best combinations among a range of potential parameters, according to their performance through a 21 years projection period (2024-2044) starting just after the intermediate period (2020-2023), and complying with keeping risks for the biomass of falling below Blim in the long term equal or less than 5%. The best performing rule (s) of every HCR were subsequently confronted to the robustness test defined for TOR 1, comparing their relative performance under alternative simulations, in order to finally select an optimal HCR where possible.

STECF notes that the main outcomes of this tuning procedures were:

- fixedF: A Fixed target fishing mortality is applied every year. The tuning led to select Fmultiplier at 0.7, i.e., fixedF = 0.7·Fmsy, as higher multipliers exceeded the maximum allowable risk. The rule was applied over the survivors of year Y-1 of each iteration.
- Besc: The Biomass Escapement HCR sets the total allowable catch (TAC) for the next year so that the level of SSB that is left at sea at the end of the fishing year is equal or higher than a predefined "escapement biomass" (Besc). At the same time the associated fishing mortality (F) should be equal or lower than a specified cap value (F_cap), to avoid risky situations. The rule was simulated on the assessment year (Y) and the results passed to the advice for the management year. Little sensitivity to Besc led to fix it at Bpa. Fcap values ranging from 0.6*Fmsy to Fmsy were tested. Fcap at 0.8*Fmsy was found to be the maximum Fcap level not exceeding the 5% maximum allowable level of risk of falling Blim in the long term.
- BoB: The Bay of Biscay type is an HCR setting directly TACs from the assessment of spawning biomass (projected at the end of the assessment year), without explicit definition of the fishing mortality. The TACs are bounded by a minimum and maximum levels (TACmin and TACmax) which will be allocated at biomasses between B1 and B2 and at biomass above B3 respectively, while intermediate TAC values will be set proportionally to intermediate biomass values between B2 and B3. For the definition of the rule it suffices defining TACmin, TACmax, B1 and B2 and the slope of increasing TACs as a function of biomass. Intuitively several rules with B1=Blim, B2=Bpa and for

TACmin at 15000 t or 20000t (around Blim) and with TACmax at 35000 t or 40000 t (around MSY) were tuned for slopes ranging between 0.6 to 1. Little contrast between the different tuning runs was noticed. The preferred formulation was not immediately apparent, as each BoB formulation passed the required performance statistics (SSB/Blim, F/Fmsy). As such three HCRs were retained: BoB_1535 (i.e. with TACmin and TACmax at 15000 and 35000 t) and BoB_1540 and BoB_2040 (with TACmin at 15000 and 20000 t respectively, and having both the TACmax at 40000 t), in all cases with B1=Blim, B2=Bpa and with slopes of 0.8. The higher the TACmax the higher is the Catch but also the Interannual variability in catches and the probability of closures.

The five retained HCR were considered to encompass most of the potential production for the anchovy stock. STECF notes that among them the safest in terms of risks to Blim was the BoB_1535 but at the expense of slightly smaller median catches (around 30000 t, versus maximum around 33000 t of other rules).

The robustness analysis showed only subtle differences in the performance statistics between the different OMs. The HCRs performed slightly better in the OM with a constant Natural Mortality by ages than with the reference OM, which indicated that the HCR are able to deal with minor M mis-specifications. Regarding the remaining robustness tests the only candidate HCR which performed adequately across the entire range of runs was BoB_1535, closely followed by BoB_1540.

STECF considers that the tuning process and robustness test were comprehensive and run in a high scientific standard manner with associated good diagnostic graphs and tables.

Finally, the management plan targets of achieving Fmsy through these HCRs by 2025 or 2028 were assessed for anchovy (TOR 2.4). It was found that no rule achieved the objective with 95% certainty by 2025. However, by 2028 such certainty is fully achieved for the BoB_1535 (slope 0.8) and almost achieved by the FixedF at 0.7Fmsy (which showed a certainty about 0.949).

Testing the impact of introducing an inter-annual change limiter (20% down and 10% up) (TOR 2.4) was only tested for the fixedF rule on anchovy. STECF notes that no major differences were found between the performance of the rule with or without such interannual variability restriction (with the exception of smaller interannual variability AAV), and that the effect was not tested further on other HCR. STECF considers that at the current stage of the testing of these HCRs this exercise was sufficient to capture the potential of this restriction, noting that it can be further tested at a later stage in the process if requested.

TOR 3 Evaluation of the Economic Performance

The EWG was requested to evaluate the maximum economic performance of the HCRs if the economic data were available and of adequate quality. The data from the 2020 Annual Economic Report on the EU Fishing Fleet (STECF 20-06), was available but a request to the Italian Ministry and to the Croatian authorities was made to get additional detailed data at smaller geographical scale. Both administrations made their data available to the EWG. The limited time available during the meeting suggested the use of short-term projections models (versus more complex models). Under a short-term approach, the size of the fleets is assumed to be constant along the simulation period and variables associated with the fleet size, like fixed costs, repair and maintenance costs and capital costs, are assumed to be constant over time. Therefore, the economic short-term effects of changes in TACs are measured only in

terms of changes in revenues and variable costs as a function of the effort required to get the TACs.

Efforts corresponding to TACs were those corresponding to the inverse of Cobb-Douglas production function fitted to the Italian anchovy fleets, while the estimation of production functions for the Croatian fleet segments was not carried out because the main target stock for these fleets is assumed to be sardine, and both landings and SSB of sardine are assumed to be constant over time for the purposes of this evaluation of the economic performance. Such constant sardine catches were set at the median catch at Fmsy.

The economic analysis used median values of TACs resulting from the MSE simulation of the different HCRs. This implied that the individual variability among iterations was not considered and this leads to overly optimistic performances. As median catch values do not encompass catastrophic events such as fisheries closures, a separate analysis was conducted based on the product of the gross profit by the annual probability of shutting down the fisheries. This analysis showed that the inclusion of risks of shutdowns led the fixedF HCR to perform less well than the other two HCR types.

STECF notices that future assessments of economic performance of management strategies would need to better couple (provided that adequate data and models are available) the actual variability in the projections iterations obtained from the MSE testing with trajectories of fishing effort and costs associated to them, so that the performance of the rules including variability could better be assessed.

STECF conclusions

STECF concludes that the EWG addressed all the ToRs satisfactorily and acknowledges the comprehensive work performed on developing ad hoc R scripts and running numerous simulations, especially for anchovy.

STECF concludes that the conditioning of the Operating Models for both stocks (anchovy and sardine) was done correctly according to the TORs, fitted to the current assessment models and to most appropriate stock recruitment relationships, including here the justified decision of changing of variability around the SRR (Sigma R) for the two stocks. Similarly, the OM variants considered for the Robustness test are state of the art and consistent with recent literature, and suitable for testing HCRs on short lived species.

STECF supports the tuning procedure used to define the best parameters for the three types of HCRs tested by the group for the anchovy stock, as well as the Robustness tests for further assessing the relative performance of the selected rules.

For sardine, the projections over the intermediate period evidenced that for the prescribed catch reductions in TOR 1.1, the stock will be on average decreasing over time and the risks of falling below Blim increasing. Therefore, STECF endorses the conclusion in the report that for sardine the next step should be to continue efforts to address the still unresolved issues in the stock assessment and reach a conclusive benchmark. STECF concludes also that precautionary management is needed until these issues are resolved, as already prescribed for the intermediate period 2020-2023.

In addition, STECF endorses the suggestions passed to managers (in the Executive summary) to set up provisions for emergency management actions in the Harvest Control Rules if the monitoring system detects more severe deteriorations of the stock status of sardine or anchovy throughout the intermediate period.

STECF concludes that while the adopted advisory process framework now applies a standard two years lag between the data input (Y-1) and the management (Y+1), the short life history of Adriatic anchovy and sardine still induces major sources of uncertainty on future population dynamic under this management framework. STECF concludes that shortening further this lag, as is currently done for the Bay of Biscay anchovy, would further improve the management system, reducing uncertainties and potentially leading to higher yield in the long term.

STECF acknowledges that the economic evaluation procedure was simplified as a result of the limited time, the data available and the need for assuming constant sardine catches. STECF notices that future assessments of economic performance of management strategies would need to better couple the actual variability in the projections obtained from the MSE testing with trajectories of fishing effort and costs associated to them, so that the performance of the rules, including variability and mixed-fisheries considerations, could be better assessed.

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5.2 EWGs 21-07 Review of the Technical Measures Regulation

Request to STECF

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

Background provided by the Commission

The EWG 21-07 was requested to address the following Terms of Reference:

1. Calculate the respective selectivity-at-age that (a) predict the highest yield at current fishing mortality rates or harvest rates, and (b) provide the greatest protection of juveniles.

2. Compare the optimised selectivity-at-age predicted under (1) with current selectivity-at-age estimates for the stocks concerned in terms of both (a) yield gains and (b) protection of juveniles

3. Compare the optimised selectivity-at-age predicted under (1) with current selectivity-at-age estimates by fleet, gear and area, which should be analysed to the most disaggregated level that is feasible in terms of both yield gains and protection of juveniles.

4. For regional case studies, explore trade-offs between fishing pressure and selectivity with a view to minimising impacts and maximizing catches under different scenarios for catch, fishing mortality and in relation to fisheries reference points. STECF is further asked to comment on practical issues regarding the attainment of the biologically optimal selection pattern in the context of mixed fisheries and multi-gear fisheries.

STECF comments

EWG 21-07 was a follow-up to the EWG 20-02 (October 2020). The expert working group met online from the 11th to the 15th October 2021. The meeting was attended by 15 experts, including four STECF members and three JRC experts. Three DG MARE representatives and one observer also attended the meeting.

STECF notes that all the ToRs were addressed by the EWG. A dataset of 33 stocks (20 in north-eastern Atlantic and 13 in the Mediterranean) was provided to the EWG. ToR 1 and ToR 2 were tackled and presented together; ToR 3 was addressed by extending the approach for

ToR 1 and 2 to compare fleet-specific selectivity patterns to the optimised selectivity pattern derived under ToR 1 in terms of both yield and the protection of juveniles. The analysis for ToR 3 was limited to a subset of stocks for which fleet disaggregated data are available.
ToR 4 was dealt with in two parts. In the first part ("4a"), for each stock the combined effects of varying fishing mortality rate and selectivity patterns were explored in terms of minimising impacts on spawning stock biomass (SSB) and maximizing catches.
The second part of ToR 4 ("4b") was interpreted as a request to comment on practical implications of trying to attain optimal selectivity in the context of mixed fisheries and multi-gear fisheries from the point of view of changes in gear technology. STECF comments follow this order.

STECF notes that throughout this document, 'selectivity' refers to 'population selectivity' to describe the differential vulnerability to fishing of the demographic components of an entire fish population, as a result of both the gear used (e.g., active or passive gear, mesh shape and size) and availability (e.g., due to the choice of time and place to fish). An increase in selectivity thus means here an increase in age at 50% selection (S50) towards the optimal age at first catch $L_c$opt at population level.

STECF notes that the analyses performed under ToRs 1 to 4a are solely based on mathematical computations involving varying population age structure dynamics and selectivity in a single stock approach, and do not contain any socio-economic consideration. Economic and management considerations in a mixed-fisheries context are discussed in ToR 4b.

STECF also notes that all the analyses (except ToR 4b) were performed with the R/FLR package FLSelex, which was developed by JRC specifically for this EWG and is available on https://github.com/Henning-Winker/FLSelex.

Stock-specific results and findings are given in the relevant sections of the EWG report and are not reproduced here. Nevertheless, based on the findings presented in the report, a number of general observations can be made in relation to the ToRs as follows.

ToRs 1 and 2

For each stock of the Annex, current selectivity (ToR 2) and optimised selectivity (ToR 1, following different scenarios for optimising yield, explained below) were quantified and the stock dynamics were projected forward for each of these selectivity patterns until equilibrium was reached. At equilibrium, (a) yield and (b) proportion of juveniles in the catch were quantified for each of these selectivity patterns. For each stock, the results were summarized as a comparison of (a) yield and (b) proportion of juveniles in the catch between current selectivity and each optimised selectivity pattern (ToR 2). The two optimisation scenarios (ToR 1) represent (i) a situation where young fish can be avoided, e.g. through spatial-temporal closure of nursery areas or through exclusion devices applied to fishing gears ("crank") and (ii) increased mesh size ("shift"). The results show which stocks benefit in terms of yield and/or protection of juveniles by improving selectivity and stocks that are currently already fished close to optimal selectivity.

Four case studies (two in Atlantic waters, two in the Mediterranean) were selected to present and discuss the methods and results in detail. The selected case studies were West of Scotland cod (cod.27.6a), which is heavily over-exploited and below B_{lim}, northern hake (hke.27.3a46-8abd), which is exploited at F_{MSY} and is above B_{lim}, red mullet in GSA 09 (MUT09), which is over-exploited but with high biomass, and hake in the Adriatic Sea (HKE.17_18), which is over-exploited with biomass around 70 percent of the precautionary biomass Bpa. The results for all the stocks are summarized in tables and plots available in the EWG 21-07 report and in Appendix 3 to the EWG report.

Regarding ToRs 1 and 2, STECF notes that:

- Any increase in selectivity will lead to a reduction in the proportion of juveniles in the catches;
- Benefits of increased selectivity include a decrease of growth overfishing, lower risk of recruitment overfishing, greater proportion of large spawners, and increased stock biomass;
- Stocks which are subject to a higher level of growth overfishing, which are typically large-bodied and late-maturing (e.g., hake stocks in the Mediterranean, cod), will (in the long term) benefit the most;
- Increase in long-term yields are linked with increase in selectivity for the vast majority of the stocks investigated. For a few exceptions only (some haddock and whiting stocks in the Northeast Atlantic), which are currently under-exploited, optimisations in yield are associated with a decrease in S50, leading to an increased proportion of juveniles in the catch;
- Similar to a reduction in F towards F_{MSY}, an increase in selectivity towards optimisation is associated with a short-term loss in yield depending on the magnitude of change and the biological characteristics of the stock. In general, those short-term losses will be more than compensated by the long-term gains;
- The "shift" scenario (mimicking an increase of mesh size) typically comes with higher yield gains compared to the "crank" scenario (mimicking nursery areas closure or use of exclusion devices), with only few exceptions, such as red mullet in GSA07 and GSA09, cod in 6a, hake in SWW, and some whiting and haddock stocks;
- The "crank" scenario generally gives better results in terms of reduction of juvenile catches, with only few exceptions, such as cod in 6a, whiting in 7a, and hake and megrim in SWW.

ToR 3

The analyses foreseen under ToR 3 were performed on a subset of stocks (13 in ICES areas, 6 in the Mediterranean) for which fleet disaggregated data were available. Two different approaches were taken. In the first approach, the results show for each fleet (within each stock) the comparison of projected (a) yield and (b) proportion of juveniles in the catch between current fleet selectivity and the optimised selectivity patterns quantified in ToR 1 as well as the current selectivity for all fleets. These results indicate, for each stock, fleets with selectivity patterns far from optimal selectivity and fleets with selectivity patterns closer to optimal selectivity. The second approach is a so-called "Jackknife" approach, in which projections are run with one fleet excluded at a time and the fishing mortality scaled to current

level of fishing mortality. In this way, it can be seen what the gains are if a particular fleet would be excluded (again, within each stock).

Regarding ToR 3, STECF notes that:

- Active gears in general perform worse in terms of protection of juveniles and yield for the analysed stocks;
- Current otter bottom trawl (OTB) selectivity leads to lower yield when compared to current selectivity of all fleets combined;
- In the Northeast Atlantic, beam trawls (TBB) often have high proportions of juveniles in the catch, with the exception of plaice in the eastern English Channel (ICES area 7d);
- Current OTB selectivity gives rise to a high proportion of juveniles (80% in numbers) in the catches of Mediterranean hake;
- The Jackknife analysis indicates that compared to the current situation, excluding OTB selectivity would give the greatest improvement in the protection of juveniles and yield to stocks of larger-bodied demersal species, such as cod and hake;
- The results from ToR 3 suggest that increases in yield and improvements in protection of juveniles can be obtained through various mechanisms; i) increasing the selectivity for OTB, ii) allocating less effort to fishing with such gears and/or iii) shifting the effort to areas/seasons where the impacts on juveniles can be minimized.

ToR 4a

In ToR 4a, for each stock, the combined effects of varying fishing mortality rate and selectivity pattern were explored in terms of yield and SSB, as well as indicating the values of F_{MSY} as a function of selectivity. The results are summarized as "isopleths" plots, which illustrate how yield and SSB can be increased by either reducing fishing mortality (shown on the X.axis) or increasing selectivity pattern (Y-axis).

As concerns ToR 4a, STECF notes that:

- All the stocks that are overexploited would gain in both yield and SSB if selectivity is increased simultaneously with decreased fishing mortality; the greatest gain would be for those stocks that are most heavily overexploited;
- Simultaneously increasing the selectivity and decreasing F would require smaller changes compared to manipulating only one parameter. This may increase the incentive (or rather decrease the disincentive) for change;
- Increased selectivity has often proportionally larger long-term effects on yield than on SSB. In many cases, a decrease in F in combination with increased selectivity is needed to see marked increases in SSB;
- Small-bodied and fast-growing species, which are commonly assumed to have high natural mortality of younger age classes (e.g., whiting stocks), have less to benefit in terms of yield from the increase in selectivity at current fishing mortality. In some cases, increased selectivity would lead to decreasing yield, but it would always result in larger SSB;
- Stocks that are currently underexploited (F<FMSY) (e.g., North Sea whiting and Irish Sea plaice) would not produce higher yield with increasing selectivity and/or decreasing F.

ToR 4b

STECF notes that EWG 21-07 responded to the 2nd part of ToR 4 ("4b") with a detailed discussion of the short-term effects of selectivity changes in selected mixed fisheries (qualitatively) and a summary of a case study of the North Sea on selectivity changes in mixed fisheries that was carried out under a different project (quantitatively using FLBEIA) (Outrequin, 2021; Outrequin et al., in prep.).

As concerns ToR 4b, STECF notes that:

- In mixed-fishery situations, technical measures are often compromises that tend to increase short-term costs for the industry, through short-term losses, re-designing of vessels and/or equipment costs;
- The mixed-fisheries multi-gear examples demonstrate the complexity in improving selection patterns. Possible solutions differ case-by-case and include a combination of gear-based and spatial/temporal measures and reductions in fishing effort;
- Simulations showed that for a given level of fishing mortality implementation of larger mesh sizes in the North Sea, at least for the main gears, would result in the long-term in larger landings, larger remaining biomass and less unwanted catches.

STECF conclusions

STECF concludes that the EWG 21-07 fully addressed all of the ToRs.

STECF concludes that the approach taken by the EWG is scientifically sound. The data used are the best available, and are sufficient to support the methods and findings. While the EWG discusses some caveats relating to the interpretation of results in Section 5 of the report, the outcomes are reliable and informative. However, while the data and methods used by the EWG are appropriate, the outputs from simulations and projections for each stock are deterministic and hence the precision of the results cannot be quantified.

STECF concludes that increasing selectivity contributes to reaching some of the current objectives of the CFP, especially if applied together with reductions in fishing mortality. Advantages of such an approach include:

- reaching the current F_{MSY} (i.e. maximum sustainable yield exploitation rate, defined as the target of fisheries management in Article 2.2 of the 2013 CFP basic regulation) with less overall reduction in fishing pressure, in particular for stocks that are currently heavily overfished.
- ensuring a higher protection of juveniles by improved exploitation patterns, as required in Article 3.2a of the current TMR.
- improved compliance with the landing obligation due to reduced incentives to underreport catches <MCRS (Article 15 of 2013 CFP basic regulation).
- discard reduction due to lower catches of individuals below MCRS (Article 2.5a and Article 4.1a of the TMR regulation).
- reducing the impact of fishing on exploited fish stocks, according to Article 2.3 of the 2013 CFP Basic Regulation which stipulate that "*The CFP shall implement the ecosystem-based approach to fisheries management so as to ensure that negative*

impacts of fishing activities on the marine ecosystem are minimized". In particular, improving selectivity together with reducing fishing pressure towards F_{msy} would lead to higher biomass than by reducing fishing pressure alone. This means that a given level of catches would be achieved with comparatively less effort, implying thus fewer greenhouse gas emissions, habitats impacts and bycatches of sensitive species.

STECF concludes that further work is still needed to progress along the review of the Technical Measures Regulation, as discussed in ToR 7.3 of this PLEN 21-03 report.

References

Outrequin T. (2021) La modification des engins de pêche peut-elle réduire l'impact de la pêche sur les ressources halieutiques? Mémoire de master, UMR ESE Institut Agro, Rennes.

Outrequin T., Gascuel D., Vermard Y. (in prep.) Landings more impacting less: a simulation of mesh sizes increase in the North Sea mixed demersal fisheries.

5.3 EWG 21-11 Stock assessments in the Western Mediterranean Sea 2021

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 comments

The working group was held remotely, from 6 to 10 September 2021. The meeting was attended by 21 experts in total, including two STECF members and two JRC experts. One observer also attended the meeting. The objective of the EWG 21-11 was to carry out demersal stock assessments in the western Mediterranean as defined in the EWG ToRs.

STECF acknowledges that the EWG has addressed adequately all ToRs. STECF notes that the EWG has carefully reviewed the quality of the assessments produced. Most of the assessments have been considered suitable for short term forecasts using the standard STF projection with assumptions of *status quo* F and historic recruitment.

Table 5.3.1 Summary of the work attempted and basis for advice in 2020 and 2021 assessments. a4a: an age-based assessment method; Index refers to the ICES Category 3 approach to advice for stocks without analytic assessment2.

Area	Species	Method 2020	Basis 2021
1_5_6_7	Hake	a4a	a4a
1_5_6_7	Deep-water rose shrimp	Index 2020	Index 2020
1	Red Mullet	a4a	a4a
5	Striped Red Mullet	a4a	Index 2021
6	Red Mullet	a4a	a4a
7	Red Mullet	a4a	a4a
5	Norway lobster	Index 2019	Index 2021
6	Norway lobster	a4a	a4a
8_9_10_11	Hake	a4a	a4a
9_10_11	Deep-water rose shrimp	a4a	a4a
9	Red Mullet	a4a	a4a
10	Red Mullet	a4a	a4a
9	Norway lobster	a4a	a4a
11	Norway lobster	Index 2020	Index 2020
1	Blue and red shrimp	a4a	a4a
5	Blue and red shrimp	Index 2020	Index 2020
6_7	Blue and red shrimp	a4a	a4a
9_10_11	Blue and red shrimp	a4a	a4a
9_10_11	Giant red shrimp	a4a	a4a

A total of 23 area/species combinations were evaluated but for four of these (Deep-water rose shrimp in GSA 1, 5, 6 & 7) separate GSAs assessments were tested but did not provide suitable results and a single global index advice is given for the combined area (Table 5.3.1). The EWG carried out short term forecasts for 14 age-based assessments. Catch advice for five stocks is based on biomass index methods.

The main results are summarized in the bullet point list below and in Table 5.3.2. Overall, the assessments indicate that 11 out of the 19 stocks are being significantly overfished, five are being fished close or at F_{MSY} and three are under-exploited. In addition, in 2020, out of these 11 overfished stocks 8 are behind transition to F_{MSY} in 2025 and 3 are ahead of transition (Table 5.3.3).

2 ICES. 2019. Advice basis. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, section 1.2. https://doi.org/10.17895/ices.advice. 5757

- Hake in GSA 1_5_6_7: the biomass is declining. Catches should be reduced by at least 39% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is behind transition.
- Deep-water rose shrimp in GSA 1_5_6_7: the biomass is fluctuating. Catches should be reduced by at least 61% to conform to precautionary considerations in 2022.
- Red Mullet in GSA 1: the biomass is declining. Catches should be reduced by at least 16% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is ahead of transition.
- Striped Red Mullet in GSA 5: the biomass is fluctuating. Catches may be increased by no more than 1% to conform to precautionary considerations in 2022.
- Red Mullet in GSA 6: the biomass is declining. Catches should be reduced by at least 45% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is behind transition.
- Red Mullet in GSA 7: the biomass is increasing. Catches should be reduced by at least 10% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is behind transition.
- Norway lobster in GSA 5: the biomass is fluctuating. Catches should be reduced by at least 35% to conform to precautionary consideration in 2022.
- Norway lobster in GSA 6: the biomass is increasing. Catches may be increased by no more than 61% to reach F_{MSY} in 2022. F_{2020} is < $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is ahead of transition.
- Hake in GSA 8_9_10_11: the biomass is increasing. Catches should be reduced by at least 54% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ progress to F_{MSY} in 2025 is behind transition
- Deep-water rose shrimp in GSA 9_10_11: the biomass is fluctuating. Catches should be reduced by at least 26% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is behind transition.
- Red Mullet in GSA 9: the biomass is increasing. Catches may be increased by no more than 64% to reach F_{MSY} in 2022. F is already below F_{MSY}.
- Red Mullet in GSA 10: the biomass is increasing. Catches may be increased by no more than 14% to reach F_{MSY} in 2022. F is already below $F_{MSY.}$
- Norway lobster in GSA 9: the biomass is declining. Catches may be increased by no more than 113% to reach F_{MSY} in 2022. F is already below F_{MSY}.
- Norway lobster in GSA 11: the biomass is low fluctuating. Catches should be reduced by at least 70% to conform to precautionary consideration in 2022.
- Blue and red shrimp in GSA 1: the biomass is stable fluctuating. Catches should be reduced by at least 72% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is behind transition.
- Blue and red shrimp in GSA 5: the biomass is stable. Catches may be increased by no more than 5% to conform to precautionary considerations in 2022.

- Blue and red shrimp in GSA 6_7: the biomass is increasing. Catches should be reduced by at least 51% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is ahead transition.
- Blue and red shrimp in GSA 9_10_11: the biomass is declining. Catches should be reduced by at least 88% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is behind transition.
- Giant red shrimp in GSA 9_10_11: the biomass is declining. Catches should be reduced by at least 51% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2025 is behind transition.

STECF notes that for hake in GSA 1_5_6_7, Norway lobster in GSA 9 and red mullet in GSA 1 and GSA 9 catches have decreased sharply in recent years. For these 4 stocks the lowest catches value of the available time series was recorded in 2020.

STECF notes that for some stocks, particularly red mullet in GSA 1 and GSA 10, recruitment has declined significantly in recent years. STECF notes that the short term forecast advice for catch accounts for trends (declines or increases) by using recent recruitment. STECF notes that if these changes are sustained they may also have implications for management. For example continued decline in recruitment will result in declining SSB and may require greater reduction in catch in order to maintain the stock biomass.

Table 5.3.2 Summary of advice from EWG 21-11 by area and species based on **F_{MSY} target for F2022**. F 2020 is estimated F in the assessment. Change in F is the difference (%) between target F (F_{MSY}) in 2022 and the estimated F for 2020. Change in catch is the difference (%) between catch 2020 and catch 2022. Biomass and catch 2018-2020 are given as an indication of trends over the last 3 years for stocks with time series analytical assessments or biomass indices. Biomass reference points are not available for any of these stocks.

Area	Species	Method / Basis	Age Fbar	Biomass 2018-2020	Catch 2018-2020	F 2020	F MSY	Change in F**	Catch 2020*	Catch 2022 at F_{MSY}	Change in catch**
1_5_6_7	Hake	a4a	1-3	declining	declining	1.94	0.44	-77%	2011	1220	-39%
1_5_6_7	Deep-water rose shrimp	Index 2020		fluctuating	increasing				1764	681	-61%
1	Red Mullet	a4a	1-3	declining	declining	1.29	0.61	-53%	98	82	-16%
5	Striped Red Mullet	Index 2021		fluctuating	declining				84	85	1%
6	Red Mullet	a4a	1-3	increasing	decreasing	0.90	0.32	-65%	1539	842	-45%
7	Red Mullet	a4a	1-3	Increasing	increasing	0.62	0.46	-27%	389	351	-10%
5	Norway lobster	Index 2021		fluctuating	declining				58	37	-35%
6	Norway lobster	a4a	3-6	increasing	decreasing	0.26	0.26	-1%	128	206	61%
8_9_10_11	Hake	a4a	1-3	increasing	stable	0.50	0.17	-67%	1983	920	-54%
9_10_11	Deep-water rose shrimp	a4a	1-2	fluctuating	increasing	1.58	1.29	-19%	1960	1455	-26%
9	Red Mullet	a4a	1-3	Increasing	declining	0.37	0.52	39%	629	1033	64%
10	Red Mullet	a4a	1-3	increasing	stable	0.31	0.40	27%	426	485	14%
9	Norway lobster	a4a	2-6	declining	declining	0.15	0.30	100%	103	220	113%
11	Norway lobster	Index 2020		low fluctuating	increasing				44	13	-70%
1	Blue and Red shrimp	a4a	1-2	stable fluctuation	fluctuation	1.68	0.29	-83%	117	33	-72%
5	Blue and Red shrimp	Index 2020	1-2	stable	declining				131	137	5%
6_7	Blue and Red shrimp	a4a	1-2	increasing	declining	0.85	0.29	-66%	549	267	-51%
9_10_11	Blue and Red shrimp	a4a	2-5	declining	increasing	1.68	0.29	-82%	366	45	-88%
9_10_11	Giant red shrimp	a4a	1-3	declining	stable	0.98	0.46	-35%	496	241	-51%

* Estimated catch from 2021 Assessments STECF EWG 21-11 or index based advice.
**Change in F is % change in F 2022 relative to 2020; change in catch % change catch 2022 relative to 2020.

Table 5.3.3 Summary of stock and fishery status by area and species, based on **F_{MSY} Transition target for F2022**. *Recent change* gives general change in F and catch over the last three years, being F2019 and F2020 estimated F in the 2021 assessment, F 2025 the F_{MSY} target for the end of transition and F2019 the starting point of the MultiAnnual Plan. The estimate of *progress so far* is shown as the F change % 2019 to 2020 and the F status relative to Transition. *Advice for 2022* is based on the F transition for the next advice year (2022) which is set at a level to reach F_{MSY} in 2025, the change in F and implied by the MAP is the difference (as a fraction) between F transition in 2022 and the F in 2019 and the most recent year for which we has estimates, F in 2020. Change in catch is from required change catch 2020 to catch 2022. Shaded rows are stocks with a precautionary advice based on indices.

Area	Species	F change 2018-2020	Catch Change 2018-2020	F 2019	F 2020	F_{MSY} Transition 2020	F_{MSY} Transition 2022	TargetF 2025 F_{MSY}	F Change % 2019-2020	F Status 2020 Rel to FMSY transition 2020	F Change % 2019-2022	F Change % 2020-2022	Catch 2020 (t)	Catch 2022 Fmsy Transition (t)	Catch Change 2020-2022
1_5_6_7	Hake	stable	declining	1.91	1.94	1.67	1.18	0.44	1%	behind transition	-38%	-39%	2011	2435	21%
1_5_6_7	Deep-water rose shrimp		increasing										1764		
1	Red mullet	declining	declining	1.53	1.29	1.37	1.07	0.61	-15%	ahead of transition	-30%	-18%	98	123	26%
5	Striped red mullet		declining										84		
6	Red mullet	decreasing	stable	1.01	0.90	0.89	0.66	0.32	-11%	behind transition	-34%	-26%	1539	1487	-3%
7	Red mullet	stable	increasing	0.62	0.62	0.59	0.54	0.46	1%	behind transition	-13%	-14%	389	396	2%
5	Norway lobster		declining										58		
6	Norway lobster	decreasing	decreasing	0.58	0.26	0.52	0.42	0.26	-56%	ahead of transition	-28%	64%	128	311	143%
8_9_10_11	Hake	declining	stable	0.54	0.50	0.48	0.35	0.17	-7%	behind transition	-34%	-30%	1983	1807	-9%
9_10_11	Deep-water rose shrimp	increasing	increasing	1.11	1.58	1.14	1.20	1.29	42%	behind transition	8%	-24%	1960	1395	-29%

9	Red mullet	declining	declining	0.83	0.37	0.78	0.67	0.52	-55%	F below F_{MSY}	-19%	80%	629	1258	100%
10	Red mullet	decreasing	stable	0.41	0.31	0.41	0.41	0.40	-24%	F below F_{MSY}	-1%	29%	426	490	15%
9	Norway lobster	declining	declining	0.22	0.15	0.23	0.26	0.30	-32%	F below F_{MSY}	18%	73%	103	195	90%
11	Norway lobster		increasing										44		
1	Blue and Red shrimp	declining	fluctuation	1.69	1.68	1.46	0.99	0.29	-1%	behind transition	-41%	-41%	117	92	-21%
5	Blue and Red shrimp		declining										131		
6_7	Blue and Red shrimp	declining	declining	1.12	0.85	0.98	0.70	0.29	-24%	ahead of transition	-37%	-18%	549	548	0%
9_10_11	Blue and Red shrimp	increasing	increasing	0.94	1.68	0.83	0.62	0.29	78%	behind transition	-34%	-63%	366	87	-76%
9_10_11	Giant red shrimp	increasing	stable	0.76	0.98	0.71	0.61	0.46	29%	behind transition	-20%	-38%	496	302	-39%

General comments

STECF considers that for the 14 age-based assessments presented in the report, the assessments can be used to provide advice on stock status in terms of F relative to F_{MSY}, and to provide catch advice for 2022. In the case of striped red mullet in GSA 5, an age-based assessment was used previously to provide catch advice, but was not accepted by the EWG this year (due to the great fluctuations in data on the landings and survey, giving instability and poor fit in the assessment), and Category 3 approach is adopted for the first time for this stock.

STECF notes that the primary catch advice is based on the target of F_{MSY} in 2022 (Table 5.3.2) and an additional advice associated with the Western Med MAP transition to F_{MSY} in 2025 is also provided (Table 5.3.3).

STECF notes that the assessments are based on short data series and some degree of uncertainty therefore remains. This is possibly even more so this year due to a disrupted 2020 MEDITS survey program and, in some cases, the reduction in the sampling of commercial catches caused by the COVID-19. However, STECF considers overall that the values presented in Table 5.3.2 provide a robust guidance on the magnitude of changes in F and catches required to reach F_{MSY} by 2022 and those provided in Table 5.3.3 provide guidance to a linear transition from 2019 to F_{MSY} in 2025.

The 14 age-based assessments form the basis of the detailed advice given in section 5 of the EWG 21-11 report. The estimates of F_{low} and F_{MSY} are considered reasonable estimates that can be expected to be precautionary and STECF considers that they can be used directly in the advice. The values of F_{upper} are indicative only; they have not been evaluated as precautionary and should not be used to give catch advice without further evaluation. The EWG 21-11 report also contains values of F and associated catch options for a linear transition in F from 2019 to reach F_{MSY} in 2025 in Table 5.3.3. Also they do not take into account uncertainty in estimates. They should be considered as guide for current progress towards F_{MSY} in 2025.

STECF notes that although hake in GSA 1_5_6_7 and red mullet in GSA 7 are behind $F_{MSY\ Transition}$ in 2020, Table 5.3.3 suggests an increase in catch advice for 2022 under the transition scenario. This is due to the increase in recruitment estimated for these two stocks in the most recent years, combined with the $F_{MSY\ Transition}$ estimated for 2022. Red mullet in GSA 7 has had increasing recruitment for a number of years, with the highest in the series in 2020 and hake in GSA 1 5 6 7 has a sharp increase in recruitment from the lowest observed in 2018 and 2019 to a high value in 2020, the highest recruitment since 2012. STECF notes though that there is always a higher uncertainty in the most recent recruitment estimates, and this increase in recruitment in 2020 will need to be confirmed by the results from next year's assessment.

STECF notes that for the stocks with analytical assessments the EWG has updated the values for both $F_{0.1,}$ used as a proxy for $F_{MSY,}$ and $F_{2019,}$ which form the basis for Western Med MAP. STECF considers that this practice should continue, but as information on the stocks improves, where possible the proxy should be replaced by estimates of F_{MSY} to ensure that advice is based on the most up to date information.

For five stocks EWG 21-11 applied a survey-based assessment following the approach adopted by ICES for category 3 stocks. STECF notes though that an updated advice is only presented for two stocks (striped red mullet and lobster in GSA 5), since for the three others (Deep-water rose shrimp GSA 1_5_6_7, Norway lobster in GSA 11, and Blue and red shrimp in GSA 5) catch advice for 2021 is reiterated from 2020 (since

assessments based on abundance index are only performed every two years by the STECF assessment EWGs). STECF notes also that according to the procedure used in the North East Atlantic, the advised change in catch for these stocks is based on the change in the stock Index of the last two years over the previous three years. A precautionary buffer of -20% shall apply if the stock status relative to MSY is unknown and if this buffer has not been applied in previous advice. STECF notes however that for the four stocks for which advice was previously based on ICES Category 3 abundance index approach, the precautionary buffer was already included in 2018 or 2019 and will not be applied again.

The COVID outbreak has impacted this year's input data for the assessments. They were affected by a number of factors, several of which relate to difficulties and reductions in sampling both of commercial and survey data. Dealing with reduced sampling of commercial data is challenging. In some cases reconstruction of usually well sampled fleets has been required and in one case the sampling was so scarce that the assessment was run without length/age data for 2020. The MEDITS surveys were affected in the following ways: in GSAs 1 and 8, it was cancelled, in GSA 9 and GSA 11, it was carried out late, in GSAs 6, 7 and 10, it was carried late and with a lower sampling coverage. STECF notes that a sensitivity analysis was performed to compare the impact of either using these partial 2020 MEDITS indices or removing the 2020 data points completely from the time series in the stock assessments. In all cases the differences were small but the assessment confidence intervals reduced with surveys, so the survey values were used in the final assessments. STECF suggests that an alternative method could be explored in the future by 'fill-in' the index for year where one of the surveys is missing through a model-based approach, such is the vector autoregressive spatio-temporal (VAST; Thorson 2019),[3] or using generalized linear models (GLMs) as a method of imputation for missing strata. However, STECF considers it little likely that this approach would result in significantly different assessment outcomes.

Inclusion of GSA 8 in crustacean assessment

STECF notes that the inclusion of crustacean assessment in GSA 8 is a complex issue mainly due to the unavailability of relevant information. The EWG was requested to include GSA 8 with GSA 9, 10 and 11 for assessments of deep-water rose shrimp, blue and red shrimp and giant red shrimp. There are two types of information used in the assessment, catch and survey. The EWG evaluated reported landings and discards of these species in GSA 8 relative to the catch in the three other GSAs. For giant red shrimp and blue and red shrimp there are no landings reported from GSA 8 in the last nine years. For deep-water rose shrimp reported landings from GSA 8 contribute less than 0.5% on average over the last 11 years with no reports prior to that. There are no discards reported for any of these species in GSA 8. Catches of less than 0.5% do not influence the assessment and can be ignored in the context of the fishery. For the survey, the area of GSA 8 contributes less than 10% of the total GSA 8, 9, 10 & 11 area, and would influence the long term trends by much less than this. Inclusion of GSA 8 survey is complicated because it was not carried out in 2020 due to COVID19 issues, so the addition of MEDITS data from this GSA is not straight forward, it would require assumptions of stability that would tend to ignore any differences anyway. Therefore, given the insignificant contribution of the landings from GSA 8 and the issues with survey data,

3 Thorson, J. T. 2019. Guidance for decisions using the Vector Autoregressive Spatio-Temporal (VAST) package in stock, ecosystem, habitat and climate assessments. Fisheries Research 210:143-161 DOI: 10.1016/j.fishres.2018.10.013

STECF considers that the advice with GSA 8 included would not be different from advice excluding this GSA and the advice given for GSA 9, 10 & 11 can safely be applied for the whole region including GSA 8. Given the level of catch in GSA 8 it seems unlikely that this situation will change in the near future.

Biomass reference points

STECF notes that biomass reference points are not available for any stocks and, specifically B_{lim} and B_{pa} that are required for Management Plans. As many of the stocks have only very short time series, the stock dynamics is often poorly specified. In some cases (e.g. *Nephrops* in GSA 9) the information may be sufficient to give acceptable reference points based directly on the stock recruit data. However, for populations such as the two hake stocks, the dynamics of recruitment cannot be fully inferred from the limited stock assessment time series available and it may be necessary to incorporate some standardized population dynamics to evaluate these reference points. This approach needs some careful evaluation, which would be a good task for the methodological EWG suggested scheduled for spring 2022. During this EWG the guidelines for the estimation of B_{lim} and B_{pa} will be defined and values for main stocks will be estimated. Besides, the potential impact of climate change on the robustness of biological reference points of Mediterranean stocks could be discussed.

EWG duration

STECF notes that the specific STECF EWG data processing workshop, EWG 21-02 resulted in more efficient and accurate data organisation and allowed for more analysis work being conducted during the 5 days assessment EWG for the Western Mediterranean 2021 assessments. However, STECF notes that workload remains high for this EWG, and it is suggested that for dealing with the data issues and carrying out better data checking during the meeting, the duration of the EWG for the Western Mediterranean assessments should be reinstated to 6.5 days as previously used.

STECF conclusions

STECF concludes that the EWG 21-11 fully addressed all the ToRs. STECF endorses the assessments and evaluations of stock status produced by the EWG. STECF concludes that the results of the assessments accepted by EWG 21-11 provide reliable information on the status of the stocks and on the trends in stock biomass and fishing mortality. For one stock where assessment was rejected by the EWG and for four other stocks, advice was provided using survey index trends.

STECF concludes that the annual values of the advised catch based on $F_{MSY\ Transition\ 2022}$ and the status of F in 2020 relative to the $F_{MSY\ Transition\ 2020}$ provide important information for the follow up of the objectives of Multi-Annual Plans.

STECF concludes that given the minor contribution of the landings from GSA 8 to deep-water rose shrimp, blue and red shrimp and giant red shrimp stocks, the advice with GSA 8 included would not be different from the advice excluding this GSA and the advice given for GSA 9, 10 & 11.

STECF concludes that to best perform the tasks that EWG for the Western Mediterranean assessments has taken on, the duration of the EWG next meeting should be reinstated to 6.5 days.

5.4 EWG 21-12 Fisheries Dependent Information II (FDI)

Request to the STECF

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

STECF observations

STECF observes that two STECF Expert Working Groups on Fisheries Dependent Information (FDI) were convened in 2021:

1) EWG 21-10: Data methodology and dissemination.

2) EWG 21-12: Evaluation of Fisheries Dependent Information for European Fleets to review the data transmitted by Member States under the 2021 FDI data-call.

The joint EWG report covering the findings of both the EWG 21-10 and EWG 21-12 was made available to the STECF PLEN 21-03.

The **Terms of Reference for the EWG 21-10** were the following:

1 – Review approaches used by Member States Responding to the FDI data call and if possible common best practice

Discuss and review the following:

1.1 Methods used by MS to partition biological sampling data to the level requested in Table A;

1.2 Review methods used by MS to define confidential cells;

1.3 Metier definitions used by MS;

1.4 Allocation of landings to c-squares using VMS/logbook data;

1.5 Coverage and methods used to estimate landings and effort data for vessels <10m;

1.6 Any other business (AOB).

2 – Based on the Ad-Hoc project proposal review methodology to assemble detailed Table A provided by Member States, the biological data as well as access suitability of proposal to disseminate details Table A

2.1 Review methodology proposed to derive detailed Table A and its suitability;

2.2 Review and propose methods that incorporate numerical indication of estimate robustness and coverage of information provided in Table A (e.g. number of samples collected for discards data).

2.3 Discuss a possibility to transfer the biological data from Mediterranean and Black Sea data call into the FDI format/database

3 – Test the comparability between the data collected in the FDI database and data provided for the fleet socio-economic data call

3.1 For 2017-2018 data, map fleet segments found in the FDI database to fleet segments found in the Fleet Economic database.

3.2 Compare sums of effort (days at sea) and landings (tonnes and values) between FDI and the dataset from the Fleet socio-economic data call by:

a. Country;

b. Fleet segment;

c. Gear type within fleet segment.

The experts are invited to prepare a presentation on their methodology in the respective Member State that will be given in the first days of the EWG.

Terms of Reference EWG 21-12 Evaluation of Fisheries Dependent Information for European Fleets:

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

4.1 As a matter of priority, the EWG is requested to ensure that all unresolved data transmission (DT) issues encountered prior to and during the EWG meeting are reported on line via the Data Transmission Monitoring Tool (DTMT) available at https://datacollection.jcrc.ec.europa.eu/web/dcf/dtmt. Such issues should be reported in full within 2 weeks of the end of the EWG.

4.2 Review outputs of ad hoc contract that provides the catches, landings and discards, at a level of aggregation corresponding to the fleet, area and gear type as specified in each exemption of each discard plan for 2022.

4.3 Review results of script developed under ToR 2.1 of EWG 21-10 and check consistency of the results produced.

4.4 Review analysis of compatibility between AER and FDI data calls produced by EWG 21-10 ToR 3 and provide relevant explanations where needed. Rerun the analysis using most recent data (if resources allow).

4.5 Review data quality checks and produce National methodological chapters

5 – Provide landings and discards data for exemptions in discard plans.

Based upon the previous work and method established in STECF EWG 20-10:

5.1 STECF is asked to provide figures for landings and discards in 2020, at a level of aggregation corresponding to the fleet, area and gear type as specified in each exemption of each of the discard plans for 2022.

5.2 STECF is asked to assess and if possible, provide percentages of discards estimates below and above MCRS at a level of aggregation corresponding to the fleet, area and gear type as specified in each exemption of each of the discard plans for 2022.

5.3 Where there is insufficient discard data for the above task, the STECF is asked to provide estimated catches (landings + discards[4]) for 2020, if possible and enough data provided during data call.

6 - Produce dissemination tables and maps of spatial effort and landings by c-squares

6.1 Discuss results of ToR 2.1 and 2.2 of the EWG 21-10 and agree the format of the Table A and biological data (FDI Tables C, D, E and F) and of the refusal rate data to be publicly disseminated in the future.

6.2 Calculate coverage of confidential data (as proposed by EWG 21-10 ToR 1.2).

6.3 If GIS technical skills are available in the EWG, produce maps of effort and landings by c-square (to be inserted in the EWG report) 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

b. Trawls (except beam trawls) with mesh < 100mm; trawls (except beam trawls) with mesh ≥ 100mm; beam trawls with mesh < 120mm; beam trawls with mesh ≥120mm; seine nets; gillnets and entangling nets; dredges; hooks and lines; surrounding nets; pots and trap.

STECF comments

The EWG 21-10 and 21-12 met virtually from 31st May to 4th June 2021, and from 13th to 17th of September 2021 respectively.

The following STECF observations, comments and conclusions are based on: (1) the presentation of outcomes from the EWG 21-10 and EWG 21-12 meetings made by the two chairpersons, (2) and from the consolidated EWG 21-10/21-12 report.

STECF observes that EWG 21-10 was primarily aimed to review various methodological issues identified in previous meetings while EWG 21-12 primarily checked the coverage and quality of data and information submitted under the 2021 FDI data call and responded to specific requests for information regarding discard estimates for specific groups of vessels that may be exempted from the obligation to land all catches in 2022.

4 'Discards' are defined here as the fish/crustaceans thrown overboard.

STECF also notes that the EWG 21-10 was the first opportunity since the new FDI data call was established in 2017 to review the methodology applied by Member States (MS), propose common practices, and follow up on future development of the FDI database and data dissemination.

STECF further notes that PLEN 21-02 was informed on the preliminary findings of the EWG 21-10. However, the EWG 21-12 revisited some of the ToRs of EWG 21-10 and provided additional information. The outcomes of the two EWGs were combined in the consolidated EWG21-10/12 report, and in the following text the statements referring to "the EWG" refer to the combined EWGs report.

STECF considers that the EWG 21-10 and 21-12 have fully addressed all their Terms of Reference.

the STECF comments are given by Terms of Reference below:

1. **Review approaches used by Member States responding to the FDI data call and if possible propose common best practice**

1.1. Methods used by MS to partition biological sampling data to the level requested in Table A

STECF observes that the EWGs obtained information from 21 Member States. 16 MS partition total discard estimates for a species proportionally to the landings of the same species within the domain. Two other MSs use effort, landings of target species, or landings of all species for partitioning of discards, while the remaining three MS do not partition because only official discards or zeros are provided. There is some variation in how countries partition discard estimates for species without landings: effort or landings of all species. Some countries do not include estimates for such species in Table A. STECF notes that the latter approach means that discard estimates for non-commercial species are likely to be missing from Table A.

The STECF also notes that discard estimates are derived using data collected under sampling plans that are not designed to provide data at the level of details required in Table A.

STECF agrees with the EWG suggesting the following best practices for partitioning of discard estimates in Table A:

- Total discards should be estimated in accordance with the design of the sampling program to ensure that the total discards of a "domain" is statistically sound. That means that the "discards domain" usually would equate to the strata in the sampling and estimation;

- The partitioning of the discards into Table A is suggested to be carried out by use of the same variable that was used for the raising of the total discards;
- It is recommended that MS also ensures partitioning of discards with zero landings in Table A.

1.2. Review methods used by MS to define confidential cells

STECF notes that three different approaches to declare data as confidential are currently being implemented (sometimes in a combined way) by Member States:

1. No data transmitted in response to the FDI data call are declared as confidential (9 MS)

2. Less than 3 vessels' rule is applied and rows concerned are marked as confidential (12 MS)

3. All rows regarding long-distance fishing fleets are marked as confidential (2 MS)

STECF acknowledges that EWG 21-10/12 performed a thorough analysis of the amount of confidential information in key variables for FDI data call (for years 2014-2020).

Previous FDI EWGs (e.g. EWG 19-11) had raised the importance of achieving a common criterion for confidentiality. STECF observes that the harmonization of the criteria used to declare data as confidential between Member States has now clearly improved. Since the size of long-distance fleets of the two MS, marking their information as confidential, is small, STECF endorses the EWG's perception that this issue is of limited extent and does not affect anymore the quality and coverage of the data to be disseminated publicly.

1.3. Metier definitions used by MS

STECF notes that all MS use the métier codes that correspond to the data call code list approved by the RCGs. STECF observes however that there still are some differences in assigning fishing activities to métier:

- large-scale fishing fleets: in most cases métier codes are assigned using logbook information, but some countries also combine with other data sources, e.g. sales notes, sampling data, scientific census survey.

- In small-scale fishing fleets: there is variation in the data sources used and, in some cases, assumptions are applied due to the lack of relevant data (e.g. small-scale fishing fleets where only sales note are available).

- In most of the cases weight or value are used to assign target species assemblages but; in a few cases, these are recorded directly in logbooks.

STECF also notes that there has been a lot of work done by ICES and RCGs to harmonise definitions and improve comparability of the metiers (including mesh size definitions). New métier codes were trialled in the ICES RDBES test data call in 2021. STECF notes that the timing of EWG 21-10 and 21-12 meetings were before the deadline of the ICES RDBES test data call for 2018-2020, so the use of the new métier codes could not be evaluated.

The EWG considered though that for the FDI data call in 2022, it should be made possible to upload new métier codes as proposed by the RCG ISSG on Métier Issues, keeping old métier codes as alternative for Member States that have issues updating their métiers. STECF notes however that since the transition to the new metier codes will generate the need for re-uploading of full FDI time series. STECF suggests thus to wait until the full agreement /check of suggested new codes has been performed by the MS and the conditions for the changes to new codes have been agreed in RCGs.

1.4. Allocation of landings to c-squares using VMS/logbook data

STECF observes that EWG summarised the methods used by MS to provide spatial data in FDI data calls so far. The majority of MSs provide FDI using coordinates of the centre of the ICES rectangle together with a rectangle type which is registered in logbooks. Only a few Mediterranean countries provide data at a smaller spatial resolution, using c-square notation and prepared using VMS data.

STECF further observes that the majority of countries include small scale fleet (SSF) data in their spatial data submissions. In cases when no data on spatial resolution for small scale fleet is available the most common approximation method is based on the port of landings.

STECF notes that the importance of spatial data for end-users constantly increases. It is recommended for MS to use VMS data as far as possible to provide spatial information at high resolution. It is also important to include small scale fleet spatial data in the FDI submissions.

1.5. Coverage and methods used to estimate landings and effort data for vessels <10m

STECF observes that, based on the country-specific presentations made during the EWG 21-10 meeting, the EWG compiled an overview of the coverage and methods used by 20 Member States to estimate landings and effort data for vessels <10m in order to respond to FDI data calls.

STECF observes that census is the most common approach used by countries to collect data on SSF (17 countries). 4 countries are using other approaches (sampling approach or combined) to provide SSF fishing activity data as declarative data in these countries are not available. The analysis conducted during the EWG meeting showed that most of the countries have a mandatory requirement for SSF to report fishing activity data. STECF

however notes that this does not guarantee full coverage of the SSF in the database unless this mandatory requirement is fully monitored. Furthermore, the official declarative data quality has to be assessed as well.

STECF agrees with the proposal of EWG to add in the future a specific section on the SSF data available in the national chapters. STECF notes that it would be the right place to highlight some issues about data quality/coverage related to this specific fleet segment and/or to indicate any improvement done in order to monitor these vessels.

1.6. Covid-19 impacts on the quality of data provided

STECF acknowledges the initiative of EWG to compile the MS-specific information on Covid-19 pandemic impact on data collection by MS in 2020 by adding a separate sub chapter in the national methodological chapters. The EWG provided also an overview categorising the impact on discard sampling and discard estimation in 2020 by quarter.

The STECF observes that more than half of MS (58%) estimated the Covid-19 impact on sampling and the estimation of the discards to be "No" or "Low". The effect on the sampling was estimated to be medium and high by 9% and 33% respectively. The effect on the discard estimation were marked medium and high for 24% and 18% respectively.

STECF observes thus that the restrictive effect of COVD-19 situation may at least partly be responsible for the lower coverage of landings with discard information in 2020, presented in the EWG report Table 2.2.1.

STECF notes that the question of Covid-19 impacts on the quality of data provided was also investigated by EWG 21-09, this time through the Member States' Annual Reports 2020. The EWG 21-09 concluded that Covid-19 restrictions particularly affected the sampling of incidental by-catch and led to cancelation/reduction of several research surveys. This resulted in low quality scores (high number of MOSTLY) for 17 MS. However, the EWG 21-09 also discussed the inadequacy of the scoring system to properly reflect the quality change of the data collection. As such, STECF notes that the analysis presented in EWG 21-10/21-12 provide a different and complementary assessment of covid-19 impact, and notes that any related data issue encountered in 2021 and reported in the DTMT will be further analysed in 2022.

1 Based on the ad hoc project proposal review methodology to assemble detailed Table A from Table A provided by MS and biological data as well as access suitability of proposal to disseminate detailed Table A

STECF observes that EWG reviewed the methodology and outputs of the ad hoc contract (Ref STECF 2116), awarded to develop and propose methodology to assemble "*detailed* Table A" from Table A and biological data in Tables C, D, E, F provided by Member States.

In general, the EWG found the methodology used in ad hoc contract to be appropriate.

However, a number of issues were encountered which resulted in only a part of the biological tables being successfully merged with the catch summary table A. The main issue centred around the misspecification of the 'domains' by Member States, which resulted in a mismatch between those used in catch summary and the biological tables.

STECF further observes that in order to overcome this problem, the EWG recommended a modification and clarification of the Domain definition in the 2022 data call to assist the Member countries on defining the domains.

The EWG also recommended that the *detailed* Table A should not be disseminated on the STECF website as such, but rather that the individual Table A and Tables C, D, E and F are disseminated in the form they are submitted. The R codes produced during the ad-hoc contracts this year and previous years should be made available on the STECF data dissemination website once adapted to fit the format and structure of the data published in the dissemination website. STECF agrees with the EWG recommendations, but notes however that there is an inherent risk of data mis-understanding, mis-use or mis-handling when providing non-experts end-users with non-merged data and scripts. STECF suggests that this is considered again and progressed during the next EWG in 2022.

STECF observes that the EWG analysed the feasibility to assess coverage, sampling rate, robustness and accuracy of the information provided by MS in Table A and suggested adding columns (Total number of Trips, Number of Samples, Number of Sampled Trips, Discard CV, Upper and Lower Confidence limits of Discard estimate) in FDI Data call tables C and D in order to obtain information needed to improve understanding of the coverage and robustness of the discards information provided during the FDI data call. STECF supports this proposal.

- *Issue of transfer of the biological data from Mediterranean and Black Sea data call into the FDI format/database*

DGMARE considers the need to rationalize the FDI database towards the establishment of a pan-European database including data for all the fisheries regions, while at the moment biological data from the Mediterranean and the Black Sea are the only ones not present in the FDI database.

STECF observes that the EWG21-10/12 analysed the present status of the both data sets and considered that the transfer of the biological data from the Mediterranean and Black Sea data calls into the FDI format/database is technically feasible and some tools have been already developed by the STREAM project. STECF observes however that the EWG still depicted a number of issues and inconsistencies between the FDI and Med&BS data calls and concluded that due to these inconsistencies it is not straightforward to transpose biological data from Med&BS data call to FDI formats.

STECF agrees that there is an urgent need to evaluate and resolve those inconsistencies/issues betweeen the two data calls, involving discussions with JRC and DG mare. STECF notes that ad-hoc contracts in 2022 would be needed to implement procedures proposed by the EWG.

STECF also notes that apart from technical issues, the need to inform MS on the transfer of the biological data from Mediterranean and Black Sea data call into the FDI format/database should be considered by including an informative note in the official data call letters.

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

STECF observes that other STECF EWGs have already attempted to compare the FDI and AER data sets in the past, and most recently the EWG 20-11 on Balance Capacity and the EWG 21-02 on Methods for Supporting Stocks Assessments in the Mediterranean. For the EWG 20-11, the analysis was a preliminary one with an ad-hoc contract focused on the landings weight and values for Belgium and Italy.

EWGs 21-10 and 21-12 analysed in details the consistency of the activity data between the two sources – AER and FDI data set. STECF further observes that the EWGs compared the information from AER data sets published on the STECF website with data submitted for 2017 and 2018 to FDI database during 2020 data call. STECF observes that the data analysis showed an improvement in data codification between both data calls and consistency between different data sets with the same information. Most of the data inconsistencies still identified between the data sets are due to: timing in data exports to answer the data call, possibility to report to FDI confidential data (that is not available in AER) and due to the clustering of fleet segments used in AER data set.

3.1. For 2017-2018 data, map fleet segments found in the FDI database to fleet segments found in the Fleet Economic database

STECF observes that EWG performed a thorough comparative analysis of the information from the two databases on:

- Fleet segments in the capacity files;
- Number of vessels in the capacity files;
- Fleet segments defined in landings data sets

STECF observes that the differences between the data sets are relatively small and can be explained e.g. by reporting inactive vessels to AER and not reporting them to FDI, by the difference in fleet segments names used when providing data to different data calls or by clustering of fleet segments in AER data due to confidentiality reasons.

STECF agrees with the EWG proposal to further improve the FDI data call guidance making sure consistent definitions and guidance are used in both data calls. STECF notes furthermore that the AER data call would also need to be checked as well, and code names improved accordingly where relevant. STECF suggests that JRC is tasked with this follow up before next year's data calls.

3.2. Compare sums of effort (days at sea) and landings (tonnes and values) between FDI and the dataset from the Fleet socio-economic data call

STECF observes that the EWG was tasked to perform the comparisons on country, fleet and gear type level within the fleet segment. The analysis revealed though that gear type data in the AER data set is reported optionally and is not a robust parameter in the data set, making such an analysis unfeasible.

STECF agrees with EWG that MS should dedicate more effort to improve national coordination during preparation of data for the FDI and AER data calls, especially defining clustering procedures, allocation of vessels to the fleet segments and when providing landing and effort data by fleet segments and metiers.

STECF also notes that in coordination with JRC, the PGECON organized two Workshops on transversal variables (Zagreb, 2015 and Nicosia, 2016), which focused on methods to calculate days at sea and fishing days. This focused approach proved successful in harmonizing methodologies on transversal data and is referenced as relevant methodology in the FDI data call specifications.

Therefore, STECF also support the EWG proposal that such a focused approach should be considered at a dedicated workshop called by RCGs in coordination with JRC, and in line with the work carried out in ISSG on Metier Issues to explore how MS allocate vessels, landing and effort to fleet segments and metiers for the FDI and AER data calls, and to

harmonize different approaches, in accordance with DCF definitions on variables and data call specifications. STECF notes also that EWG 21-09 (Tor 5.7 of this PLEN 21-03 report) has collected extensive quality annexes describing data collection protocols by Member States, which may provide useful information in this process.

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

4.1. *As a matter of priority, the EWG is requested to ensure that all unresolved data transmission (DT) issues encountered prior to and during the EWG meeting are reported on line via the Data Transmission Monitoring Tool (DTMT). Such issues should be reported in full within 2 weeks of the end of the EWG.*

STECF acknowledges that the data provided by Member States in response to the 2021 FDI data call, and incorporated into the FDI database, represent the most comprehensive data set currently available on fishery-dependent information from European fleets for the years 2014-2020. However, STECF notes that a number of shortfalls and gaps have still been identified in the data submitted. The unresolved issues that still require to be addressed by Member States were all recorded in the Data Transmission Monitoring Tool (DTMT).

4.2 *Review outputs of ad hoc contract that provides the catches, landings and discards, at a level of aggregation corresponding to the fleet, area and gear type as specified in each exemption of each discard plan for 2022*

STECF notes that the EWG21-12 reviewed the methodology and outputs of the ad hoc contract (# 2045) awarded, as in previous years. This ad hoc contract provided data on landings and discards, at a level of aggregation corresponding to the fleet, area and gear type as specified in each anticipated exemption contained in the individual discard plans for 2022. STECF observes that the methodology used in the ad hoc contract was appropriate and identical to the one used in previous years.

STECF observes that Member State-specific catch fractions were provided for the majority of anticipated 2022 exemptions. Two sets of estimates were computed: i) estimates for exempted fleets for which discard sample data were provided and ii) estimates for exempted fleets for which no sample data were available, so-called 'fill-ins'.

STECF observes however that the same data limitation applies for this exercise as in previous years, however STECF acknowledges that the EWG has attempted to provide catch fractions for exemptions to the Landing obligation required by DG MARE for planning purposes. STECF further observes that the EWG was not able to provide catch fractions for exemptions containing operation-specific conditions such as engine power (kW), tow duration (≤90 mins) and proximity to the shore (within 12 nautical miles), as such information is not available in the FDI database.

In the re-occurring situation of data limitations observed by the EWG, STECF stresses the need for discards information for exemptions proposed by Regional Advisory Groups, required by DG MARE for planning purposes and e.g. as basis for conservation measures under Union environmental legislations. STECF concludes that this additional data collection may well go beyond the DCF/EU-MAP requirements and that specific data needs such as these need to be collected in targeted sampling on the national or regional level (See also ToR 5.7).

4.3. Review data quality checks and produce National methodological chapters

STECF observes that data submitted by each Member States were thoroughly reviewed. The review included the methodology used for responding to the data call and the coverage, quality and consistency of data submitted. The review sections by Member State are reproduced in Annex 1 of the EWG 21-10/12 Report.

STECF notes that Member States are responsible for providing checked and validated data. Given the complexity, size, and high level of disaggregation of the datasets submitted, some erroneous records are though still expected to occur, despite of the extensive automated checks already implemented by the JRC.

STECF further notes that experts attending the meeting conduct essential additional time-consuming checks, which have compromised the ability of the EWG to address other essential TOR's. Ideally, the EWG should have a dedicated meeting, restricted to checking the integrity of the database, that should not include any requests for advice.

STECF observes that the EWG recommends a methodology meeting to be held every second year. STECF support this recommendation since these methodology meetings form an essential pillar to the functioning of this EWG as they facilitate the development of methods used to answer the data call and check quality of the data. The experience of having such a meeting in 2021 ensures that such dedicated methodology meetings have clear positive effect on the quality of the data (and subsequent advice), and significantly reduce the time required for data checking during the advice meeting. These methodology meetings also provide a space in which historical data can be explored and investigated for stability and consistency across years. This feature of the meeting will become increasingly important as FDI will request more historical years in future data calls (pre 2014).

5 – Provide landings and discards data for exemptions in discard plans.

5.1 *STECF is asked to provide figures for landings and discards in 2020, at a level of aggregation corresponding to the fleet, area and gear type as specified in each exemption of each of the discard plans for 2022. Where there is insufficient discard data for the above task, the STECF is asked to provide estimated catches (landings + discards) for 2020, if possible and enough data provided during data call.*

STECF acknowledges that EWG 21-12 put a lot of effort to provide discard estimates for each anticipated exemption for 2022. However, some exemptions required detailed information currently not available in the FDI database (i.e. distance fished from shore and vessels engine power). Based on the feasibility of the EWG to extract the relevant data, exemptions were characterised in four categories:

Category 1 – "Yes": hereby the discard estimates are calculated exactly as described in the Delegated Acts.

Category 2 – "Partly/Yes": hereby the discard estimates are calculated as described in the Delegated Acts but not taking into account the MCRS which makes part of the exemption.

Category 3 – "Partly": hereby the discard estimates are calculated as described in the Delegated Acts without taking into account some specifications (e.g., within 3 nautical miles, flip-up rope or benthos panel, engine power < 221 Kw, tow duration of no more than ninety minutes, etc.),

Category 4 – "No": hereby it is impossible to calculate discard estimates as described in the Delegated Acts. This implies where the Delegated Acts include e.g., specific areas – IXa Gulf of Cadiz – or purse seine with net not fully taken on board, processing on board to obtain surimi).

STECF observes that EWG21-12 summarised the discard information in two types of tables: tables with landings and discards reported by MS and estimated for the fleets under exemptions (Tables 1-12 in Annex 4) and tables with FDI data reported and filled in aggregated by species and sub regions (Tables 14-18 in Annex 4). In addition this year EWG 21-12 added Table 13 with discards <MCRS for exemptions.

STECF also notes that considering the shortcomings highlighted by the EWG and previous STECF plenaries, the resulting estimates should be interpreted with caution.

5.2 *Discard estimates by exemption*

STECF observes that the estimated discards for fleets likely to make use of anticipated exemptions to the landing obligation in 2022, the details of the anticipated exemptions and associated data available are given for each region in sections 3.5.2.1 to 3.5.2.5 and in Tables 1-18 (Annex 4) of the EWG21-10/12 report.

5.3 *STECF is asked to assess and if possible, provide percentages of discards estimates below and above MCRS at a level of aggregation corresponding to the fleet, area and gear type as specified in each exemption of each of the discard plans for 2022*

STECF observes that as for the previous years, estimation of the proportion of fish above and below the MCRS by species, country, métier, year was done merging tables A, D and F using the fields domain discards and domain landings.

STECF also observes that the EWG provides a detailed description of computation of the numbers above and below MCRS by Country, Year, Area, and metier.

STCF notes that it was only possible to extract data for the exemptions with the available biological data. Corresponding total discard estimates and % of discards below MCRS per exemption and country in 2017-2020 are provided in Table 13 of Annex 4.

STECF observes that where exemptions relate to multiple species, the percentages for each species above and below MCRS related to the catch of that species only and not to the total catch of all species concerned in the exemption.

The results of calculations for landings and discards <MCRS per Member States and metier are presented in Annex 5 of the EWG21-10/12 report.

6 - Produce dissemination tables and maps of spatial effort and landings by c-squares

6.1 *Discuss results of TOR 2.1 and 2.2 of the EWG 21-10 and agree the format of the table A and biological data (FDI Tables C, D, E and F) to be publicly disseminated in the future.*

Biological data (Tables C, D, E, F)

STECF observes that the EWG21-12 discussed the outcome from TOR 2.1 and 2.2 of the EWG 21-10 and recommended that the biological tables are disseminated in the form that they are submitted. EWG 21-12 further recommended that next year (2022) an R script can be prepared by the EWG expert(s) and made available as an attachment to the EWG Report once it is adapted to fit the format and structure of the data published in the dissemination website.

STECF agrees with the EWG and notes that this process would require disseminating Domain Landings and Discards in Table A. Prior to dissemination of the biological data with the script, the final outputs should be shared with the national correspondents seeking for their approval to publish the data for the first time. Afterwards publication of the data should be mentioned as part of the data call informing MS about intended use of the data.

Refusal rates (Table B)

STECF observes that the EWG21-12 recommended disseminating Table B as submitted by Member States. This table mainly relates to the at-sea sampling programmes and contains refusal rates estimated by Member States from statistically sound sampling frames.

STECF notes that this information should be disseminated with some guidance on what the table contains, i.e references and links to the definitions in the data call, and the methodologies used to derive data which can be found in the national chapters in the report.

6.2 *Calculate coverage of confidential data (as proposed by EWG 21-10 Tor 1.2)*

STECF observes that the EWG compiled the criteria, used to define confidential cells by Member States in section 3.1.2. of the report and presented the coverage of confidential data for some key variables based on the data submitted by each MS in response to the 2021 FDI data call. The EWG also listed the sub-regions where more than 50 percent of the weight and value of landings are marked as confidential (Table 3.1.2.4 in the report).

Overview Figures 3.1.2.1 and 3.1.2.2 show the percentage of the data submitted in tables I and H that have been marked as confidential by region, gear type and year for the period 2014-2020.

STECF agrees with the EWG that the dissemination of EWG outputs in form of data sets of capacity, catches and effort tables should stay as stated in recommendation of the STECF 19-11:

• Data that are aggregated across Member States can be published without removing the data marked as confidential as it will be impossible to isolate the confidential data.

• When publishing data at Member State level, data marked as confidential by the Member State in question should be redacted.

6.3 *Produce maps of effort and landings by c-square (to be inserted in the EWG report) 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;

b) Trawls (except beam trawls) with mesh < 100mm; trawls (except beam trawls) with mesh ≥ 100mm; beam trawls with mesh < 120mm; beam trawls with mesh ≥120mm; seine nets; gillnets and entangling nets; dredges; hooks and lines; surrounding nets; pots and traps.

STECF observes that that a comprehensive set of maps of spatial effort and landings were produced for all fishing regions and major gear types. They were included in Annex 6 of the EWG Report and are available at the EU level for public access in the STECF web: https://stecf.jrc.ec.europa.eu/dd/fdi.

STECF observes that in order to account for the different geographical formats allowed in data call, the geographical data validation process adopted earlier (STECF19-11) was implemented and documented in a series of scripts made available to the experts during and after the working group. STECF agrees that such data checks should be included in the FDI data call uploading tool.

STECF acknowledges that the geographical data validation process highlighted an overall improved quality of the spatial data submitted with only 0.71% of invalid records for Table I (Effort by rectangle) and 0.61% invalid records for Table H (Landings by rectangle).

Proposals to improve future data calls

STECF observes that the EWG21-10/12 discussed and proposed updates to the data call, methodological issues and guidelines to improve future data calls. The EWG proposed updates to Domains definitions, updates to Tables C, D and B and to Appendix 3 of the FDI data call. In particular, new columns (Total number of Trips, Number of Samples, Number of Sampled Trips, Discard CV, Upper and Lower Confidence limits of Discard estimate) in FDI Data call tables C and D would improve understanding of the coverage and robustness of the discards information provided during the FDI data call.

STECF notes that discussions on future changes in the FDI data call are also given in section 7.4 of this PLEN 21-03 report.

STECF conclusions

STECF concludes that the EWG 21-10/12 appropriately addressed all ToRs defined.

STECF concludes that two FDI meetings conducted in 2021 allowed to further improve and harmonise methodology reporting to the FDI data call and had a positive effect on the quality of the data (and subsequent advice). Methodology meetings also provide a space in which historical data can be explored and interrogated for stability and consistency across years. This feature of the meeting will become increasingly important as FDI requests more historical (pre-2014) years in future data calls. Therefore, STECF

suggests conducting methodology meetings every second year to facilitate further development of FDI and use of additional quality indicators to be added in the future data calls.

STECF concludes that additional biological data should for now be published in the same format as provided by MS, as proposed by the EWG 21-10/12. STECF notes that prior to release of any additional data the format should be shared with National Correspondents informing about the publication of the data. STECF also concludes that the publication of the R script creating "detailed Table A" by merging Table A with Biological data (Tables C, D, E and F) would facilitate future data use by end users. STECF concludes however that a merged detailed Table A would still remain easier for end-users to manipulate than individual tables and scripts, and that this issue should be reconsidered in future EWG

STECF endorses all the EWG's proposals to change the FDI data call clarifying definitions and providing further specification to the Member States providing data.

STECF concludes on the need for better discards information to evaluate the exemptions proposed by Regional Advisory Groups, required by DG MARE for planning purposes and e.g. as basis for conservation measures under Union environmental legislations. STECF concludes that as this additional data collection may well go beyond the DCF/EU-MAP requirements, additional specific data may need to be collected in targeted sampling on the national or regional level.

STECF supports the EWGs' proposed updates to the FDI data call.

STECF endorses the EWGs proposed procedure for solving through a dedicated ad hoc contract the remaining technical issues preventing data translation from Med&Black Sea data call format to FDI. STECF also concludes that additional note informing MS about the transfer of the data from Med&Black Sea database to FDI database should be included in both data calls official letters in 2022.

5.5 EWG 21-15 Stock assessments in the Mediterranean Sea 2021 (Adriatic, Ionian, Aegean Seas)

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 comments

The working group was held remotely, from 18 to 22 October 2021. The meeting was attended by 14 experts in total, including one STECF member and one JRC expert. Two observers also attended the meeting.

The main objective of the meeting was to carry out assessments and provide advice for the demersal stocks in the Adriatic and Ionian Seas as listed in the ToRs of the report. No stocks from the Aegean Sea was assessed this year.

STECF acknowledges that the EWG has addressed adequately all ToRs. STECF notes that the ToRs consisted, as in previous years, of data preparation, stock assessment, estimation of reference points, short-term forecasts, identification and reporting of data issues and synoptic overview for management advice.

Summary of performed assessments

A total of 9 area/species combinations were assessed (Table 5.5.1). In the case of Norway lobster in GSAs 17-18 the stock was also evaluated on a sub-area basis in order to specifically address ToR 3. Eight out of the nine species had been assessed in 2020 by STECF EWG 20-15. Only the combined stock (GSA 18, 19 and 20) of Giant red shrimp had not been previously assessed by STECF, while the combined GSAs 18-19 was assessed in 2020 by GFCM using age based assessment method (GFCM 2021).

Table 5.5.1 Summary of the work attempted and basis for advice (in Bold). A4a is an age based assessment method, SS3 is an age/length integrated model; SPiCT and CMSY are surplus production methods. STF is a standard short term projection with assumptions of status quo F and historic recruitment. Index refers to the ICES Category 3 approach to advice for stocks without analytic assessments.

Area	Species	Method	Basis
		2020	2021
GSA 17-18*	Hake^	SS3	**SS3 STF**
GSA 17*	Sole^	Index 2020	SS3 **Index 2020**
GSA 17-18	Red mullet^	a4a	**a4a STF**
GSA 17-18**	Common cuttlefish	CMSY	SPiCT **CMSY**
GSA 17-18[x]	Norway lobster^	SPiCT	**SPiCT STF** Biomass Index SURBA
GSA 17-18**	Spottail mantis shrimp	a4a	**a4a STF**
GSA 17-18-19	Deep-water rose shrimp^	a4a	**a4a STF**
GSA 18-19-20**	Giant red shrimp		A4a **Index 2021**
GSA 19*	Hake	a4a	**a4a STF**

* Stock with a GFCM benchmark. ** Stock boundaries are defined by EWG 21-15 on the basis of expert knowledge. ^ Stocks under the 2019 GFCM demersal MAP (GFCM/43/2019/5). [x] In line with ToR 3 in view of the assessment at Adriatic

level being considered not precautionary by GFCM WGSAD 2020 in order to explore fishing mortality levels and stock status based on a whole Adriatic assessment vs sub-areas. Index 2020 for Sole is repeated from last year assessment.

The EWG carried out short term forecasts for 5 age-based assessments and one surplus production model. The remaining stock, common cuttlefish, is short-lived and an estimate of equilibrium catch is available, but forecasting two years ahead depends on recruitment in the intermediate year, therefore forecasts were not attempted.

STECF notes that the assessment of two stocks (Sole in GSA 17 and Giant red shrimp in GSA 18-19-20) could not be completed, as complex issues arose, reaching beyond standard assessment procedures that could be achieved in the EWG time frame, and which would require more advanced investigation and dedicated time (see below). Catch advice for these two stocks is thus based on biomass index methods. Sole in GSA 17 had prior advice from 2020 for 2021 and 2022, and this is reiterated here.

STECF notes that the EWG was not able to give catch advice for the Giant red shrimp stock in GSA 20, due to both data gaps and data coherence issues. STECF acknowledges the progresses achieved in spring 2021 for improving the current data coverage of the Greek fisheries during the EWG 21-02. Nevertheless, some data gaps still persist and will need to be further addressed over the coming years before obtaining reliable stock assessments in the area. STECF supports and encourages further progresses in this direction.

Stocks trend and advice

The main results are summarized in the bullet point list below and in Table 5.5.2 and Table 5.5.3. Table 5.5.2 presents stock and fishery status and options for exploitation at F_{MSY}, or based on the precautionary approach if an assessment is not available. Table 5.5.3 provides a summary by stock of progress to 2020, based on F_{2020} in the most recent assessment, which includes the effect of any changes implemented before and during 2020. Table 5.5.3 also provides the future F and catch options for 2022 based on the linear transition in F from 2019 to F_{MSY} in 2026. Overall, the assessments indicate that 3 out of the 5 age-based assessed stocks are being significantly overfished i.e. F_{2020} is >> F_{MSY} (Hake in GSAs 17-18, Spottail mantis shrimp in GSAs 17-18 and Deep water shrimp in GSAs 17-18), one is being fished close to F_{MSY} (Hake in GSA 19) and one is under-exploited (Red mullet in GSAs 17-18). The two stocks assessed with surplus production models are estimated to be fished below F_{MSY} (Nephrops in GSAs 17-18 and common cuttlefish in GSAs 17-18). For the stocks included in the GFCM MAP only for deep water rose shrimp is the decline in F from 2019 to 2020 shown to be behind the seven year transition in year 1 of the plan.

- Hake in GSAs 17-18: the biomass is increasing. Catches should be reduced by at least 40% to reach F_{MSY} in 2022. F_{2020} is < $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2026 is ahead of transition.
- Sole in GSA 17: the biomass is declining. Catches may be increased by no more than 22% to conform to precautionary considerations in 2022.
- Red mullet in GSAs 17-18: the biomass is increasing. Catches may be increased by no more than 37% to reach F_{MSY} in 2022. F_{2020} is < $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2026 is ahead of transition.
- Common cuttlefish in GSAs 17-18: the biomass is increasing. Current catches are estimated below those corresponding to F_{MSY} in equilibrium.
- Norway lobster in GSAs 17-18: the biomass is increasing. Catches may be increased to some extent without only limited risk of reaching above F_{MSY} in 2022. F is already below F_{MSY}.
- Spottail mantis shrimp in GSAs 17-18: the biomass is increasing. Catches may be increased by no more than 3% to reach F_{MSY} in 2022.

- Deep-water rose shrimp in GSAs 17-18-19: the biomass is stable. Catches should be reduced by at least 40% to reach F_{MSY} in 2022. F_{2020} is > $F_{MSY\ Transition\ 2020}$ so progress to F_{MSY} in 2026 is behind transition.
- Giant red shrimp in GSAs 18-19-20: the biomass is fluctuating. Catches should be reduced by at least 22% to conform to precautionary considerations in 2022.
- Hake in GSA 19: the biomass is increasing. Catches should be reduced by at least 28% to reach F_{MSY} in 2022.

Table 5.5.2 Summary of stock and fishery status by area and species, **based on F_{MSY} target for F_{2022}**. F 2020 is estimated F in the assessment. Change in F is the difference (%) between target F (F_{MSY}) in 2022 and the estimated F for 2020. Change in catch is the difference (%) between catch 2020 and catch 2022. Biomass and catch 2018-2020 are given as an indication of trends over the last 3 years for stocks with time series analytical assessments or biomass indices. Biomass reference points are not available for any of these stocks. Shaded cells are precautionary advice based on indices.

Area	Species	Method/	Age	Biomass	Catch	F 2020	F MSY	Change in F	Catch 2020*	Catch 2022 at F_{msy}	Change in catch
		Basis	Fbar	2018-2020	2018-2020						
GSA 17-18	Hake	SS3	1-4	increasing	declining	0.37	0.18	-52%	4841	2920	-40%
GSA 17	Sole	Index 2020	biomass	declining	declining				1605	1960	22%
GSA 17-18	Red mullet	a4a	1-3	increasing	declining	0.37	0.36	-5%	3123	4279	37%
GSA 17-18	Common cuttlefish	CMSY	biomass	increasing	declining	0.07	0.16	123%	2150	7450**	247%
GSA 17-18	Norway lobster	SPiCT	biomass	increasing	declining	0.16	0.37	131%	870	1986	128%
GSA 17-18	Spottail mantis shrimp	a4a	1-3	increasing	fluctuating	0.66	0.44	-33%	4780	4945	3%
GSA 17-18	Deep-water rose shrimp	a4a	0-2	stable	stable	1.61	0.72	-55%	5121	3092	-40%
GSA 18-19-20	Giant red shrimp	Index 2021	biomass	fluctuating	fluctuating				386	303	-22%
GSA 19	Hake	a4a	0-4	increasing	declining	0.29	0.15	-47%	584	420	-28%

* Estimated Catch from 2021 Assessments STECF EWG 21-15 or index based advice. Change in F is % change in F_{2022} relative to F_{2020}, Change in catch % change catch 2022 relative to 2020. ** Catch for common cuttlefish is not advised catch but represents average long term yield at FMSY.

Table 5.5.3 Summary of stock and fishery status by area and species, for stocks included in the GCFM 2019 MAP **based on $F_{MSY\ Transition}$ target for F_{2022}. Recent change** gives general change in F and catch over the last three years. F_{2019} and F_{2020} are both estimated F in the 2021 assessment. F_{2026} is F_{MSY} the target for the end of transition, F_{2019} is the starting point of the MAP. The estimate of progress so far is shown as the F change % 2019 to 2020 and the F status relative to $F_{MSY\ Transition2020}$. **Advice for 2022** is based on the $F_{MSY\ Transition2022}$ for the next advice year (2022) which is set at a level to reach F_{MSY} in 2026, the change in F and implied by the MAP is the difference (as a fraction) between $F_{MSY\ Transition}$ in 2022 and the F in 2019 and the most recent year from the available estimates, F in 2020. Change in catch is from required change catch 2020 to catch 2022.

Area	Species	F change 2018-2020	Catch Change 2018-2020	F 2019	F 2020	F_{MSY} Transition 2020	F_{MSY} Transition 2022	Target F 2026 F MSY	F Change % 2019-2020	F Status 2020 Rel to F_{MSY} Transition 2020	F Change % 2019-2022	F Change % 2020-2022	Catch 2020	Catch 2022 F_{MSY} Transition	Catch Change 2020-2022
GSAs 17-18	Hake	declining	declining	0.47	0.37	0.43	0.35	0.18	-22%	ahead of transition	-27%	-6%	4841	5262	9%
GSAs 17	Sole		declining										1605		
GSAs 17-18	Red mullet	declining	declining	0.68	0.37	0.63	0.54	0.36	-45%	ahead of transition	-20%	45%	3123	5979	91%
GSAs 17-18	Norway lobster	declining	declining	0.25	0.16	0.27	0.30	0.37	-37%	F below FMSY	20%	89%	870	1627	87%
GSAs 17-18-19	Deep-water rose shrimp	stable	stable	1.63	1.61	1.50	1.24	0.72	-1%	behind transition	-24%	-23%	5121	4513	-12%

Assessments quality and robustness of advice

Generic comments across all stocks

STECF notes that the assessments are based on short data series and some degree of uncertainty therefore remains, perhaps even more so this year due to a disrupted 2020 MEDITS survey program and in a few cases reduced commercial catch sampling caused by the COVID19. However, STECF considers overall that the values presented in Table 5.5.2 provide a robust guidance on the magnitude of changes in F and catches required to reach F_{MSY} by 2022 (except for cuttlefish which is just indicative of MSY at equilibrium), and those provided in Table 5.5.3 provide guidance to a linear transition from 2019 to F_{MSY} in 2026 for stocks included in the GCFM 2019 MAP. The 7 assessments form the basis of the detailed advice given in section 5 of the EWG 21-15 report. The estimates of F_{low} and F_{MSY} are considered reasonable estimates that can be expected to be precautionary and STECF considers that they can be used directly in the advice. The values of F_{upper} in the report are indicative only – they are not included in the management plan and they have not been evaluated as precautionary and should not be used to give catch advice without further evaluation. The EWG 21-15 report also contains values of F and associated catch options for a linear transition in F from 2019 to reach F_{MSY} in 2026 in Table 5.5.3. These are the best estimates of F and catch required in 2022 to follow a linear transition, irrespective of progress so far. Also they do not take into account uncertainty in estimates. They should be considered as guide for current progress towards F_{MSY} in 2026.

STECF observes that for many of the stocks evaluated the number of years of S-R data is very limited and it is not possible to carry out full evaluations of MSY, because the stock - recruit relationships cannot be established.

STECF notes that the STECF EWG data processing workshop EWG 21-02 did not result in more efficient and accurate data organisation in EWG 21-15 partly due to resubmission of data but also to difficulties in comparing with previous data sets. New issues were thus encountered by EWG 21-15: For deep water rose shrimp processing errors from last year (from EWG 20-15) were found; for spottail mantis shrimp a script error dealing with growth occurred; for giant red shrimp there were data extraction issues within submission in the most recent data call. These diverse issues delayed work and were resolved only for Spottail mantis shrimp during the EWG week, but on the last day. For deep water rose shrimp work was carried out after the EWG 21-15 and the issue resolved. For giant red shrimp a GFCM assessment for GSAs 18-19 was adapted to include GSA 20 but all the issues could not be resolved in time and index advice was used instead. For this stock it is though expected that an assessment can be obtained in the future. These difficulties are in contrast with the situation of the Western Med Assessment EWG (EWG 21-11) which was improved by the data processing workshop (ToR 5.3 of this plenary). STECF notes though that most of these issues relate to data preparation, not to the running of assessments. Therefore, it might be desirable to perform more data checks prior to the EWG as long as the stock list is agreed well in advance of the EWG. However, STECF acknowledges there may be logistical reasons why additional data meeting in the autumn may not be possible. There are a number of improvements that can be made; more extensive exploration of the data prior to the EWG (similar to EWG 21-02); checking new data submissions for data quality to ensure updates do not contain spurious characters; standardised routines that compare updated data sets with the previous checked data to identify quickly which values have changed. However, it is often only when finally running and comparing assessments that problems are fully identified, and only slightly longer meeting (similar to previous years) will be able to react appropriately to the discovery of issues late in the process.

Specific comments

For the two stocks with advice based on abundance indices (sole in GSA 17 and Giant red shrimp in GSAs 18-19-20), a precautionary buffer of -20% catch reduction was included in 2020 or 2021. The advised change in catch for these two stocks is based on the change in stock over the last two years relative to three years before.

In the case of Norway lobster in GSA 17-18, sub-area analysis suggested that two areas (Ancona Grounds and GSA 18) show strong indications of low biomass and are potentially in need of additional reductions in catch beyond the catches allocated proportionally.

STECF also notes that the procedure for providing catch advice from probabilistic models is complex and not yet fully established. This would be a good area for development and cooperation with GFCM or other providers of fisheries advice.

Sole GSA 17 advice

STECF notes that for sole in GSA 17, EWG advice has been provided based on the precautionary approach used by STECF from 2020. The expert group (EWG 21-15) lacked the confidence to use the updated assessment to provide robust advice due to a lack of detail on preparation of data and model implementation as well as some data access issues. During the STECF plenary it was suggested that an updated forecast (see below) could be preferable to the simple biomass-based advice (survey index) put forward by the EWG. Such a forecast was prepared for STECF by members of the EWG during the STECF plenary and is presented below.

Basis of Forecast:

The basis of advice is the 2021 benchmark assessment using data up to 2019 performed by GFCM. Instead of updating the assessment model, only the forecast catches for 2020 were updated for each fleet (i.e. no impact on parameter settings and no new survey data). Catches 2021 were assumed to be equal to 2020 catches. Catches for 2022 and subsequent years were set as 0.8, 0.9, 1.0 and 1.2 times the 2020 catches to provide alternate scenarios. Future catches are predicted without error, i.e. equal to the values provided in the forecast in accordance with the benchmark (Figure 5.5.1). Advice is provided on the basis of the GFCM reference points (SPR_{40}, F_{40} and F_{20}), which are generally regarded as relatively conservative reference points compared to F_{MSY} and B_{MSY} or their proxies. The provision of 2022 advice is based on the critical values of F in 2022 and the resultant SSB in 2023 i.e. the F that gives <95% probability of $B_{2023}<B_{lim}$). Applying F40 directly would result in an increase in risk of $B<B_{lim}$, which would not be compatible with the CFP objective of maintaining B above B_{lim} with a high probability.

Results

The median estimates of F/F_{40} from the ensemble (Table 5.5.4) indicate that the F target reference point is reached in 2021 (¬50% probability above and below). Further reductions in catches, especially under the predicted increase in biomass indicate the stock would be underexploited.

The biomass targets (SSB_{40}/SSB_{virgin}) from the ensemble indicate that the stock has already recovered to its Biomass target in 2022 and catches of 1.2*Catch 2020 will retain stock levels at this target while constant catch or catch reductions will lead to further increases in SBB.

However, increasing catches to 1.2* Catch 2020 has a greater than 5% probability of SSB falling below the limit threshold of B_{20}, suggesting that it is not possible to keep the stock at the target biomass without some additional risk (around 10%) at equilibrium conditions and this probability is likely to increase with more variable recruitment not considered in the simulations.

As the stock is already within F and biomass targets, but is projected to be just outside precautionary limits in 2023 but returning within precautionary limits with status quo catch in 2024 and 2025, STECF considers that further catch reductions are not necessary.

Table 5.5.4. Short term forecast for sole in GSA 17 performed during PLEN 21-03. For four catch options of 0.8, 0.9, 1.0 and 1.2* reported catch 2020 based on 2020 GFCM assessment and 2020 reported catch. Historic values 2017 to 2020 are shaded grey. All scenarios show F < F target in 2022 (yellow shading), SSB just above B target in 2023 (Green shading). Probability of B>Blim (shaded pink) show that catches greater that catch in 2020 imply more than 5% risk of falling B<Blim (P(SSB>SSB20)<95%), while catches equal to or less than catch in 2020 give risk of B in 2023 just around 5% (P(SSB>SSB20) just below 95%) but falling below 5% (P(SSB>SSB20) > 95%) by 2024 and 2025. The status quo catch line 2021-2025 is highlighted in blue.

Scenario	Metric	2017	2018	2019	2020	2021	2022	2023	2024	2025
		observed catches				interim year	TAC year			
Catch2022-2025=0.8*Catch2020	Median SSB/SSB40	0.76	0.70	0.71	0.80	0.93	1.01	1.08	1.15	1.19
	Median F/F40	1.36	1.08	1.01	0.71	0.69	0.55	0.54	0.53	0.53
	P(SSB>SSB20)	0.74	0.69	0.70	0.76	0.85	0.91	0.96	0.99	1.00
	Catch	2305	1935	1933	1536	1536	1229	1229	1229	1229
	Median Fbar	0.36	0.29	0.27	0.19	0.18	0.15	0.14	0.14	0.14
	Median Biomass	3223	2914	2944	3299	3873	4224	4563	4840	5051
Catch2022-2025=0.9*Catch2020	Median SSB/SSB40	0.77	0.70	0.71	0.80	0.93	1.01	1.05	1.07	1.08
	Median F/F40	1.36	1.09	1.01	0.71	0.69	0.62	0.62	0.62	0.61
	P(SSB>SSB20)	0.74	0.69	0.70	0.76	0.86	0.91	0.95	0.98	0.99
	Catch	2305	1935	1933	1536	1536	1382	1382	1382	1382
	Median Fbar	0.36	0.29	0.27	0.19	0.18	0.17	0.16	0.16	0.16
	Median Biomass	3219	2903	2936	3301	3866	4209	4471	4664	4796
Catch2022-2025=Catch2020	Median SSB/SSB40	0.76	0.70	0.71	0.80	0.93	1.01	1.07	1.11	1.14
	Median F/F40	1.36	1.08	1.01	0.71	0.69	0.70	0.70	0.70	0.71
	P(SSB>SSB20)	0.74	0.69	0.70	0.76	0.85	0.91	0.94	0.96	0.98
	Catch	2305	1935	1933	1536	1536	1536	1536	1536	1536
	Median Fbar	0.36	0.29	0.27	0.19	0.18	0.19	0.19	0.19	0.19
	Median Biomass	3227	2907	2940	3298	3879	4219	4377	4495	4562
Catch2022-2025=1.2*Catch2020	Median SSB/SSB40	0.76	0.70	0.71	0.80	0.93	1.01	1.01	0.99	0.98
	Median F/F40	1.36	1.08	1.01	0.71	0.69	0.85	0.88	0.90	0.91
	P(SSB>SSB20)	0.74	0.69	0.70	0.76	0.86	0.91	0.92	0.92	0.92
	Catch	2305	1935	1933	1536	1536	1843	1843	1843	1843
	Median Fbar	0.36	0.29	0.27	0.19	0.18	0.23	0.23	0.24	0.24
	Median Biomass	3221	2906	2946	3298	3876	4234	4221	4139	4077

Advice

The advice is to maintain catches in 2022 at the level reported in 2020, this implies a catch of 1536 tonnes in 2022. The results of the extended projections suggest that with the reduction in catches observed in 2020 the stock was exploited sustainably in 2020 and further reduction in catches are not necessary. In the medium-term some increase in catches may be possible as the biomass increases and if strong recruitment events permit. As F is already below F target no transition to target F is necessary, so no specific F_{MSY} transition scenario is provided.

As this assessment estimates that F is already at F target in 2020, and expected to remain below F target in 2021, no further effort reduction for fleets targeting sole is required for achieving F target for sole in GSA 17 in 2022.

Notes on the assessment quality

STECF has provided advice on the basis of the 2021 GFCM benchmark assessment with data to 2019, but notes that this assessment has shortcomings in the way it treats the length data. It also misses age data and there are some concerns over historic catch treatment and ecological realism / comparison to other sole stocks. Although classified by GFCM as an age-structured length-based model it behaves much more like an age structured production model (ASPM) predominantly relying on historic catch information and recent survey biomass information. The ensemble does relatively little to propagate the uncertainties along the major axes of uncertainty. The conservative choice of reference points is though consistent with reference points applied to biomass models and are suitable for this assessment. Therefore, STECF concludes the advice based on the GFCM benchmark model to be robust, but suggests that a number of model improvements may help reduce uncertainty in the stock dynamics and therefore allow for more precautionary management at higher long-term yield.

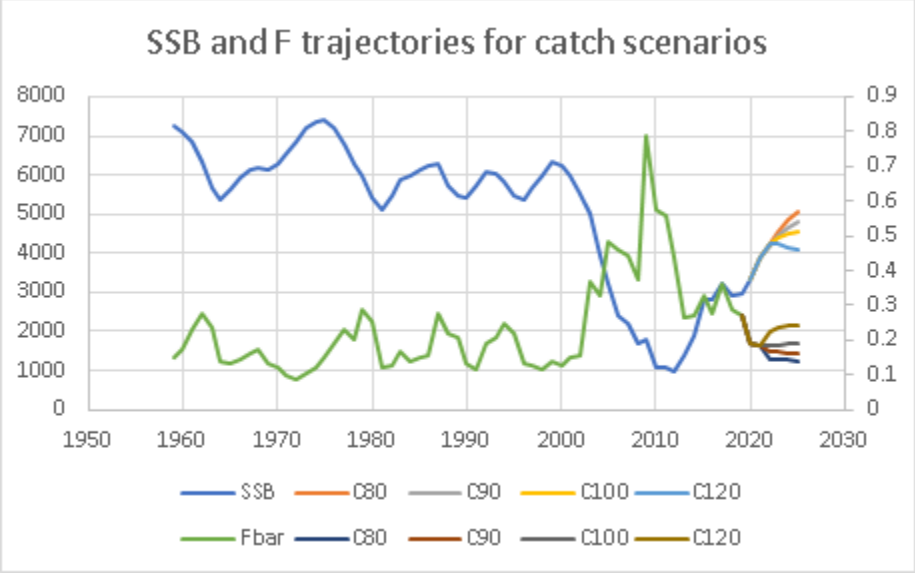

Figure 5.5.1. Median SSB and F for Sole in GSA 17 from 1959 to 2020 and short term projection options of 0.8, 0.9, 1.0 and 1.2 times catch in 2020 for 2022 to 2025. Assuming catch in 2021=catch in 2020.

<u>Biomass reference points</u>

STECF notes that for the stocks with long time series (Norway lobster and common cuttlefish) B_{lim} and B_{pa} values are provided. As many of the other stocks have only very short time series, the stock dynamics is often poorly specified. Biological data will also have to be revised and updated. For stocks such as both the hake stocks, it is unclear whether recruitment has been reduced due to low biomass from high exploitation or some other causes. There may be a need to incorporate some standardised stock dynamics in the process in order to evaluate biomass reference points for these stocks, by fitting stock recruitment functions to the data both with and without priors on steepness to determine a plausible range of stock dynamics that both fits the data and conforms to expected ranges of Stock recruit parameters. In addition, the possible impact of climate change on the resilience and stability of Mediterranean stock biological reference points would need to be considered. These approaches need careful evaluation, which would be a good task for a methodological EWG in spring 2022. In addition, STECF suggests that the proposed EWG in 2022 could be adequate to quality check the Mediterranean and Black Sea data currently not scrutinised in STECF stock assessment, using the same methodology as in the EWG-21-02.

EWG duration

STECF notes that 5 days of the specific STECF EWG 21-15 was not sufficient, also considering the additional data issues beyond what had been addressed during EWG 21-02. As discussed above, an extension of the duration of this EWG should therefore be considered. STECF suggests that the EWG should be reinstated at 6.5 days to allow sufficient time to recover from data issues and carrying out a better data checking during the EWG.

STECF conclusions

STECF concludes that the EWG fully addressed all the ToRs. STECF endorses the assessments and evaluations of stock status produced by the EWG. STECF concludes that the assessments completed for five area/species combinations by EWG 21-15 can be used to provide advice on stock status in terms of F relative to F_{MSY} and on being behind/ahead transition to MSY in 2026 for stocks included in the GCFM 2019 MAP.

STECF also endorses the uses of the advised catch based on $F_{MSY\ Transition\ 2022}$ and of the status of F in 2020 relative to the $F_{MSY\ Transition\ 2020}$. These provide important information for the follow up of the objectives of Multi-Annual Plans.

STECF has developed an additional advice procedure for sole in GSA 17, and concludes that further catch reductions are not necessary, but that increasing catches by 20% compared to their 2020 level would increase the risk of SSB falling below Blim above 5%.

STECF supports the review of the model for sole in GSA 17 be passed to the GFCM assessment WG to assist with the benchmark.

STECF concludes that local biomass and exploitation rates vary greatly across Nephrops sub-areas, and additional protective measures may need to be considered around Ancona Ground and in GSA 18.

STECF concludes that for Giant red shrimp in GSAs 18, 19 & 20 the assessment is regarded as preliminary and further work is required to reassemble the Length Frequency data and allow better data exploration.

STECF concludes that to best perform the tasks that EWG for Adriatic, Ionian, and Aegean Seas assessments has taken on, the duration of the EWG next year should be reinstated to 6.5 days.

5.6 EWG 21-16 Balance / Capacity

Request to the STECF

The STECF is requested to review the report of STECF Expert Working Group 21-16 meeting, evaluate the findings and make any appropriate comments and recommendations. The STECF is requested to assess the extent to which the STECF Expert Working Group 21-16 delivered on its Terms of Reference.

The STECF is in particular requested to assess the following findings presented by the STECF Expert Working Group 21-16 and to formulate its conclusions and recommendations on each of them:

- The assessment of both the status and trends of the balance situation of EU fleet segments in line with the Commission guidelines (COM(2014)545).
- The findings on whether, in accordance with the Commission Guidelines (COM(2014)545), the annual national fleet reports submitted by 31 May 2021 present an appropriate and complete analysis of balance between fleet capacity and fishing opportunity for each Member States' fleet segments.
- The observed discrepancies between the national balance assessments and those carried out by STECF Expert Working group 21-16 and the reasons for those as identified by the STECF Expert Working group.
- The opinions provided for each concerned Member State whether the proposed measures in new or revised action plans submitted with the most recent fleet reports are likely to redress the imbalance in the fleet segments concerned.
- The assessment of the balance situation in the outermost regions, especially with regard to the absence of data required to undertake an assessment for the fleet segments concerned.

STECF comments

STECF reviewed the report of EWG 21-16 and observes that all the ToRs were addressed.

Values for the following indicators as specified in The Commission guidelines (COM(2014) 545) are presented for the period 2009-2019:

Biological indicators

- Sustainable harvest indicator (SHI). SHI values are not considered if the landing values that are included in the SHI / total landings value ratio is less than 40% (SHI>40%).
- Stocks at risk indicator (SAR).

Economic indicators

- Return on investment (ROI) and/or Return on Fixed Tangible Assets (RoFTA).
- Ratio between current revenue and break-even revenue (CR/BER).

Technical indicators

- The inactive fleet indicators (IV).
- The vessel use indicator (VUR)

In addition, values for the following indicators were also computed by the EWG:

- Economic dependency indicator (EDI)
- Number of overfished stocks (NOS)

STECF notes that the terms "in balance" and "out of balance" (imbalance) and analogous terms, are used strictly in relation to the criteria given in the Commission guidelines (COM (2014) 545 Final). Such terms are used to describe a favourable (in balance) or unfavourable (out of balance) situation based on the value computed for specific indicators in relation to the threshold specified for such indicators. Trends in indicator values are expressed over different time-periods which vary by indicator and Member State. Comparisons between indicator values as computed by the EWG and those in the National fleet reports for 2020 submitted by Member States by 31 May 2021 are based on reference year 2019 unless specifically mentioned in the report.

Assessment of both the status and trends of the balance situation of EU fleet segments including the outermost regions.

Table 5.6.1 presents the number of segments used for the calculation of each indicator, for the whole EU and split by each sea area (North Atlantic Ocean, Mediterranean and Black Seas and Other Fishing regions). It also includes the number of segments that are in balance, out of balance, and the trend assessment of the indicators, as reported by the EWG 21-06.

For the whole EU, out of 629 active fleet segments in 2019, landings in weight and value were available for approximately 90% of them. Of these 629 active fleet segments only 31% of them were considered meaningful to assess balance or imbalance (SHI≥40%) and 69% for the case of SAR. Economic indicator values (CR/BER and RoFTA) were available for 61% of the total active fleet segments, while for RoI this percentage reduced to 17%.

For all the segments for which the EWG 21-06 considered meaningful to assess balance or imbalance, for the case of SHI>40% indicator, the majority were out of balance (67%) and for the case of SAR the majority were in balance (52%). In the case of all the economic indicators, a majority of the segments were in balance (>64%). Finally, for the case of technical indicator VUR, half of the segments were in balance and other half, out of balance.

In the North Atlantic Ocean (NAO) the SHI could be estimated and meaningfully to be assessed (SHI>40%) for the 37% of the 368 fleet segments of this area, with 67% of them out of balance and 33% in balance. The SAR was estimated for 77% of the total segments in this area, half in balance and half out of balance. Economic indicators values (CR/BER and RoFTA) were available for 61% of the total active fleet segments in this area, while for RoI this percentage was 17%. The majority of the fleet segments considering these three economic indicators were in balance (73%, 71% and 62% for CR/BER, RoFTA and RoI, respectively). Finally, for the case of the VUR technical indicator, half of the segments were in balance and other half, out of balance.

For SHI, none or no clear trend was possible to obtain for 52% of the fleet segments in the NAO. 31% of the fleet segments had an improving trend, 16% a deteriorating trend, and 1% were considered to have a no clear trend. For the three economic indicators, the majority of the segments had a deteriorating trend. Finally, no clear overall picture could

be depicted by the technical indicators as for the majority of the segments (68%), there was no clear trend.

Table 5.6.1. Total number of segments and by sea-basin as calculated by the EWG 21-06, considered in balance and out of balance and their trend, by each balance indicator.

				Biological		Economic			Technical	
Area			Total	SHI>40%	SAR	Cr/BER	RoFTA	RoI	VUR	IV
EU	Coverage	Total	629	195	434	382	382	107	543	139
	Balance	In balance		70	226	265	261	68	278	126
		Out of Balance		125	208	117	121	39	265	13
NAO	Coverage	Total	368	135	282	223	223	78	334	78
	Balance	In balance		45	146	163	158	48	173	68
		Out of Balance		90	136	60	65	30	161	10
	Trend	Deteriorating		21	NA	122	139	41	15	16
		Improving		42	NA	70	76	30	24	17
		No clear		61	NA	23	0	1	227	34
		Flat		1	NA	0	0	0	10	0
		Not calculated		10	NA	8	8	6	58	11
MBS	Coverage	Total	203	43	143	139	139	22	178	44
	Balance	In balance		12	77	90	91	17	80	41
		Out of Balance		31	66	49	48	5	98	3
	Trend	Deteriorating		5	NA	36	37	6	15	9
		Improving		19	NA	54	68	8	12	14
		No clear		4	NA	15	0	0	82	18
		Flat		1	NA	0	0	0	13	0
		Not calculated		14	NA	34	34	8	56	3
OFR	Coverage	Total	58	17	9	20	20	7	31	17
	Balance	In balance		13	3	12	12	3	25	17
		Out of Balance		4	6	8	8	4	6	0
	Trend	Deteriorating		2	NA	9	12	3	2	1
		Improving		2	NA	6	6	2	2	4
		No clear		10	NA	3	0	0	16	10
		Flat		0	NA	0	0	0	3	0
		Not calculated		3	NA	2	2	2	8	2

In the Mediterranean and Black Seas (MBS) the SHI could be estimated and meaningfully to be assessed (SHI>40%) for the 21% of the 203 fleet segments in this area. 72% of them were out of balance and 18% in balance. The SAR was estimated for 70% of the total segments in this area, half in balance and half out of balance. Economic indicator values (CR/BER and RoFTA) were available for 68% of the total active fleet segments in this area, while for RoI this percentage reduced to 11%. For these indicators the majority of them were in balance (65%, 65% and 77% for CR/BER, RoFTA and RoI, respectively). Finally,

for the case of the VUR technical indicator, 45% of the segments were in balance and 55% out of balance.

In the MBS, for SHI, the trend was improving for 44% of the fleet segments, 12% had a deteriorating trend and for the rest, the trend could not be calculated (33%), was not clear (9%) or flat (2%). For the three economic indicators, an improving trend was calculated for the 39%, 49% and 36% of the fleet segments, considering the CR/BER, RoFTA and RoI, respectively, while it was deteriorating for 26%, 27% and 27%, respectively. For the majority of the remaining segments the trend could not be calculated. Finally, no clear overall picture could be depicted by the technical indicators, as for the majority of segments (78%) there was no clear trend, or it could not be calculated. STECF notes this was likely to be expected, since many segments are small-scale part time segments for which VUR is most likely largely uninformative.

In the Other Fishing Regions (OFR) the SHI could be estimated and meaningfully to be assessed for the 29% of the 58 fleet segments in this area, the majority of these 17 segments with a not a clear trend (59%). The coverage for the SAR indicator was even lower (16%). For the limited number of segments for which economic indicators could be computed (34%, 34% and 12% for CR/BER, RoFTA and RoI, respectively), the majority were found to be in balance. The sparse data indicate that the economic situation appeared to be worsening. The technical indicators imply that the fleet segments were generally in balance with their fishing opportunities in 2019 although the coverage for VUR was of only half of the total fleet segments in this area. No clear trend could be depicted for the majority of these segments for VUR.

Discrepancies between the national balance assessments and those carried out by STECF EWG 21-16

6 out of 23 fleet reports submitted by Member States were prepared fully in line with the Commission guidelines. The 17 other MS followed the guidelines to varying degrees. The reasons why, as extracted from the EWG 21-16 report, are listed in Table 5.6.2 below. The specific reasons vary by Member State but can be summarised as follows:

- Use of different fleet segmentation than the DCF as requested by the Commission guidelines.
- Omission of segments (not even capacity data is reported by Member State).
- Use of the indicator values computed by the STECF in the year prior to the year the fleet report is submitted (mainly SHI).
- Lack of available indicators reported (mainly SAR).
- Lack of rationale to explain an "in balance" situation when the EWG calculated indicators show the opposite.
- Not providing an action plan for the segments considered out of balance.

Table 5.6.2 presents a summarized breakdown by Member State of the EWG 21-16 findings on whether the fleet report is in accordance with the Commission Guidelines (COM(2014)545) and if the EWG found discrepancies between the national and the EWG calculations.

Table 5.6.2. Summary of the EWG assessment on whether the MS fleet reports were prepared in line with the Commission guidelines and the calculations equal those made by the EWG 21-06.

Member State	National report follows Commission guidelines (CG)	Indicators: Comparison between MS report and EWG 21-16 calculations	EWG 21-16 Comments
Belgium	Yes	Discrepancies found.	The MS considered all segments to be in balance. No action plan presented.
Bulgaria	No	Similar	Different methodology than in the CG, for F, SAR and technical indicators.
Croatia	Yes	Similar	Lack of explicit SAR indicator.
Cyprus	Almost	Similar	Lack of explicit SAR indicator.
Denmark	No	Not provided	SHI and SAR not provided. No action plan provided.
Estonia	No	Not provided	Biological indicators for year 2019 were not calculated and MS present the values extracted from the EWG 20-11
Finland	No	Not provided	None of the indicators are provided. No action plan.
France	No	No	The fleet segmentation differs between the national report and the one used by the EWG. The MS considers that the economic and technical indicators are not relevant for their assessment of balance.
Germany	Yes	Similar	No comments from the EWG.
Greece	No	No	Extensive information but not following the guidelines. No explicit assessment of balance by the MS.
Ireland	No	No	Biological indicator values are not based on the most recent data. The MS considers that the DCF segmentation is not adequate.
Italy	No	No	Indicators are reported separately by segment and GSA, this makes the comparison impossible.
Latvia	Almost	Similar	SAR indicator not provided. No new action plan.
Lithuania	Yes	Similar	No action plan for the distant water fleet.
Malta	Almost	Similar	No SHI (explained in the MS report) nor SAR.
Netherlands	Almost	No	No additional information as requested in point 9 of the CG.
Poland	Almost	Similar	Divergences in the years used among the indicators.
Portugal	No	Not provided	Lack of rationale on providing the main conclusion of being in balance for all fleet segments.
Romania	Almost	Similar	Six SAR estimates missing in the MS fleet report but calculated by the

			EWG.
Slovenia	Almost	Similar	Different methodology for SAR and some discrepancies in CR/BER for some indicators.
Spain	Yes	No	Large discrepancies in the identification of SAR.
Sweden	No	No	Different segmentation used by the MS and SAR not provided.
United Kingdom	Yes	Yes	Not action plan provided.

Opinions provided for each concerned Member State whether the proposed measures in new or revised action plans submitted with the most recent fleet reports are likely to redress the imbalance in the fleet segments concerned.

Regarding the action plans submitted, the majority were not sufficiently detailed regarding the precise measures to be implemented or their objectives and targets for reducing the perceived imbalance in the fleet segments concerned (as requested by the Commission guidelines). Furthermore, the information provided was not sufficient for the EWG to quantitatively assess whether such measures would be sufficient to address any perceived imbalance or whether any stated objectives are likely to be met in a defined timeframe (Table 5.6.3).

Table 5.6.3. Summary of the EWG assessment of the action plans submitted in the Member States reports.

Member State	**New or revised action plan submitted**	**EWG 21-16 comments**
Belgium	No	No comments from the EWG.
Bulgaria	Yes	How actions are to be implemented and the expected effect from such measures on overcapacity in the fleet is neither described nor assessed. The EWG could not assess if the actions proposed will influence the balance.
Croatia	Yes	Not clear objectives, and no quantitative evaluation and timeframe. The EWG could not assess if the actions proposed will influence the balance.
Cyprus	Yes	Partial of only some segments. The EWG could not assess if the actions proposed will influence the balance.
Denmark	No	The MS considers its management system to be well functioning in order to secure a balance.
Estonia	No	The Member State states that vessels belonging to the same fishery should be analysed together as dividing them into smaller subsets might distort the results. Based on that the MS did not provide a new or revised action plan.
Finland	No	The MS considers its management system to be well functioning in order to secure a balance.
France	Yes	An update from the one submitted in 2020. The level of details differs from segment to segment.

		The EWG could not assess if the actions proposed will influence the balance.
Germany	Yes	Describes the targets measures and timeframes to be used.
Greece	No	No comments from the EWG.
Ireland	No	The MS considers that structural imbalance does not exist, so no action plan is proposed.
Italy	Yes	A revision is presented. The EWG could not assess if the actions proposed will influence the balance.
Latvia	Yes	An update of the action plan submitted in 2019. The EWG could not assess if the actions proposed will influence the balance.
Lithuania	Yes	Only for the Baltic Sea fleets but not for the Distant water fleet. The EWG could not assess if the actions proposed will influence the balance.
Malta	No	Resubmitted the 2019 plan. More a statement of intent to improve monitoring. The EWG could not assess if the actions proposed will influence the balance.
Netherlands	No	The MS considers its management system to be well functioning in order to secure a balance
Poland	Yes	Targets, tools and timeframes for the action plan are clearly stated. However, the EWG could not assess if the actions proposed will influence the balance.
Portugal	No	The MS considers its management system to be well functioning in order to secure a balance.
Romania	Yes	Seems an update of previous ones. The EWG could not assess if the actions proposed will influence the balance.
Slovenia	No	The MS considers that all fleet segments are in balance.
Spain	Yes	Objectives well defined but the timeframe not specified. The EWG could not assess if the actions proposed will influence the balance.
Sweden	Yes	The EWG could not assess if the actions proposed will influence the balance.
United Kingdom	No	UK leaving the EU.

STECF notes that, in general, for the action plans presented in national fleet reports, the EWG 21-16 was not able to assess if the actions proposed will influence the imbalance. The main reasons were in cases the lack of quantitative objectives and/or the timeframe for the actions proposed.

STECF conclusions

STECF concludes that all terms of reference were successfully addressed by the EWG 21-16 to the extent possible.

Based on the findings in the EWG 21-16 report and the indicators and criteria specified in the Commission guidelines, the following general conclusions can be drawn:

- The biological indicators for the North Atlantic Ocean (NAO) basin suggest that most of the fleet segments appear out of balance, although for fleet segments for which

a meaningful trend in SHI can be computed, the majority show an improving trend. Conversely, the economic indicators suggest that most fleet segments are in balance, although overall the trends indicate a worsening situation related to the increasing evolution of the main cost items of the fleets.

- For the Mediterranean and Black Sea (MBS), according to the biological indicators, most of the fleet segments are out of balance. Conversely, the economic indicators suggest that most fleet segments are in balance. The number of segments for which trends for these indicators were calculated was low compared to the total number of segments in the MBS, making any trend assessment unreliable for the whole MBS sea basin.
- For the case of technical indicators, no clear trend can be depicted for the NAO and MBS. STECF reiterates the conclusion of PLEN 20-03 that the use of VUR indicator is misleading for small scale segments and/or seasonal fisheries, given that their maximum days is very variable.
- No reliable assessment of the balance and of the trends could be made for the majority of the OFR segments due to lack of data. However, STECF is aware that for the French OMRs, an expanded data collection programme commenced in 2021 and a similarly-expanded programme has been proposed in the French DCF Work plan for 2022-2024 (see also ToR 5.7 in this report). STECF considers that this is likely to improve the data coverage in this region.

- Many Member States' annual fleet reports were not prepared strictly in line with the Commission guidelines but the extent to which departures from the guidelines influence Member States' overall assessment of balance in their fleet segments cannot be determined.
- Where there is a difference between the calculation of the indicators made by the EWG and those reported in the Member States' fleet reports, the EWG cannot validate the action plans submitted by the Member States, because the segments considered out of balance by the Member States and those identified based on the EWG estimations, differ.
- None of the fleet reports for 2020 provide data and information that demonstrate how the measures in new or revised action plans are intended to redress any imbalance in the fleet segments identified as such. Furthermore, many action plans do not provide any timeframe for implementation of the measures or explicit targets as requested by the Commission guidelines.
- None of the fleet reports provide a clear assessment of the previous action plans on how these have affected the imbalance situation of the fleet segments concerned.
- In most cases, concluding on whether the fleet reports from Member States reports provide a sound and comprehensive analysis of balance between capacity and fishing opportunities is not possible, because the rationale for determining whether a fleet segment is or is not in balance with its fishing opportunities is not explained in sufficient detail or is not explained at all in the national reports.

5.7 EWG 21-17 Revision of Work Plans for data collection and data transmission issued

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 comments

The EWG 21-17 met virtually 1-5 November 2021. As the meeting took place one week before STECF PLEN 21-03, the final EWG report was not yet available to PLEN 21-03. No Data Transmission Issues (DT issues) had been reported in due time before the meeting, hence DT issues were not assessed by EWG 21-17.

STECF notes that EWG 21-17 was asked to:

- evaluate the national work plans (WP) submitted by Member States and the regional work plans (RWP) submitted by two regional coordination groups (RCGs) by 15 October 2021, in terms of conformity, scientific relevance of the data and quality of the methods and procedures;
- validate the outputs of the pilot studies run under the EU MAP 2017-2019 and their potential extension to 2020-2021. This task refers to the pilot studies: PS3 on social variables and PS4 on aquaculture variables. It also includes PS2 on impacts on the ecosystem, after some re-draft to accommodate suggestions proposed by STECF PLEN 21-02 in July.

<u>Evaluation of national DCF Work Plans 2022 and beyond</u>

To carry out the evaluation, STECF notes that EWG 21-17 was provided with 25 national WPs for the years 2022 – 2024 or beyond (Austria and Luxemburg did not submit a WP).

National WPs describe the planning of data collection in the Member State and should cover at least three years (2022-2024), but may include a longer period. STECF notes that four Member States submitted WPs referring to the period 2022-2027 (Estonia, Spain, the Netherlands, and Ireland) while the remaining 21 Member States submitted WPs for 2022-2024.

STECF notes that the WPs are based on the new multiannual program for data collection (EU-MAP) that will apply from 1 January 2022 and the format of the WPs follows a revised template explained in a new guidance on the WP/Annual Report (AR). Furthermore, compared to previous WPs, the tables of the WP have been restructured and reshuffled and some tables have been merged.

STECF notes that the quality assurance framework has been moved from tables (5A and 5B) to annexes (1.1 and 1.2) in the WPs. Some Member States submitted more than 50 documents referring to annex 1.1 and 1.2 which made it difficult for the EWG to assess the

annexes in detail during the EWG. As the quality annexes deliver detailed information on the related procedures and methods of quality assurance by sampling scheme in the Member States an in-depth assessment of the annexes in a dedicated EWG or by ad-hoc contracts is required. The assessment is required to look beyond the scope of the EU and should be checked against international standards and best practice in international bodies, building also on the earlier review of international standards for data quality assurance performed by EWG 17-04, which provides useful reference to the assessment.

Referring to annex 1.2 (Economic data), STECF notes that with the aim of improving harmonisation in terms of reporting structure, content and details, an intersessional working group under RCG ECON governance should further elaborate on the details of the annex and develop examples for quality reports.

STECF notes that an appropriate procedure for further handling of the quality annexes would include:

- adoption of WPs;
- MS to address EWG 21-17 comments and send them to the Commission;
- Regional Coordination Groups to provide best-practice examples based on the revised quality annexes;
- separate in-depth assessment of the annexes, having the EWG 21-17 comments (and MS efforts to address those) and RCG outcome at hand, in either a separate dedicated EWG or a number of ad-hoc contracts;
- endorsement of the EWG/ad-hoc contract work at STECF Plenary;
- comments sent to MS to be considered for WP updates.

STECF notes that prior to the EWG, all WPs were pre-screened through a series of ad-hoc contracts and by the Commission services. Based on the advice of STECF (PLEN 21-01), the legal deadline for submission of the WPs was shifted from end to mid-October, and this early submission facilitated intensive pre-screening of WPs through ad-hoc contracts before the EWG. This enabled, for the first time, Member States to be provided with the pre-screener assessments of the WPs and to resubmit WPs before the start of the EWG. The resubmitted WPs were then evaluated by the EWG 21-17. Most Member States that resubmitted their WP addressed the comments and recommendations from the pre-screeners.

STECF notes that after the WP assessment by the EWG, several inconsistencies, e.g. between tables and with the Master Code List, still remain. However, subsequent to the EWG, only a few 'major' issues and some 'minor' issues were left for Member States to resolve before the WPs can be adopted. During the EWG, a lot of tedious manual checking was necessary, which further underlies the need for an online reporting platform, connected to a database containing information on fisheries and the planning and implementation of sampling, as previously advised (STECF PLEN 14-02, 14-03, 15-02, 16-02, 17-02, 17-03, 18-02, 19-03, 20-02, 20-03).

Evaluation of regional Work Plans

STECF notes that the EWG conducted a second test evaluation of two regional Work Plans. The plans were submitted by the Regional Coordination Groups for the Baltic Sea (RCG Baltic) and for the North Atlantic, North Sea & Eastern Arctic (RCG NANSEA). The Regional Work Plans included sections on biological data collection of fisheries and international/regional coordination. The EWG provided comments on the approach and procedure but also detailed comments of the proposal by section.

Pilot studies

STECF notes that Member States were requested to provide summaries to the Commission on the Pilot Studies carried out under the EU-MAP 2017-2019. The summary reports were analysed & harmonised by ad-hoc contracts before submission for review to the EWG. EWG 21-17 reviewed the summary reports of pilot studies referring to social data (PS3) and environmental data (PS4) from aquaculture as well as the redrafted report of ecosystems effects of fishing (PS2) and highlighted that the prospects as well as limitations of data collection related to the pilot studies have been described well.

Additional STECF comments

The aim of the EU Data Collection Framework is primarily to provide data to support fisheries management. Within the DCF, Member States are able to prioritise certain activities such as sampling of discard data from the most important fleets/stocks. Hence, fleets of less importance might not be sampled. Many end-users request data from the DCF, including regional bodies as basis for exemptions from the landing obligation conservation measures under Union environmental legislations, Brexit implications related to data disaggregation into EEZ zones (cf. ToRs 5.4 and 7.4 of this PLEN 21-03 report), etc. However, as these requests often consider minor fisheries or a high disaggregation level of data, they may be only partially covered by the DCF or be at a different scale as the one required by the end-user. STECF considers that specific data needs such as these may need to be supplemented by in targeted sampling schemes in the Member States or the region.

Fishing activity data is collected mainly through the EU Control Regulation (CR). In the WP, only additional data collection deemed necessary by the Member State is included, e.g. if the data from the CR is not considered sufficient. During the review of fishing activity data from the Member States' small-scale fisheries (SSF) at the EWG on fishery-dependent information (FDI, cf. ToR 5.4 of this plenary), it became clear that several Member States are collating fishing activity data from the SSF by additional sampling approaches. STECF notes that, in these cases, data end-users can consult the WP quality annexes in addition to the WP section 3.1 on fishing activity data to investigate the coverage and quality of data collection.

STECF conclusions

STECF endorses the outcomes of the EWG 21-17 presented by the chairperson during the STECF PLEN 21-03. The final EWG report was not yet available at the time of the PLEN 21-03 meeting.

Despite the numerous new elements in this year’s evaluation, STECF concludes that the EWG has addressed its Terms of Reference completely. The preparatory work carried out by pre-screeners and the earlier deadline for submission of WPs, allowing Member States to resubmit WPs prior to the meeting, have been fundamental to ensuring a comprehensive assessment of WPs during EWG 21-17.

STECF would like to further stress the need of an online reporting platform, in connection with a database, for the planning and implementation of Work Plans, on both Member States’ and regional level.

STECF concludes that the procedures and methods of quality assurance described in the quality annexes (1.1 and 1.2) in the national WPs should be further assessed in a dedicated EWG or by ad-hoc contracts. Furthermore, STECF suggests that EWGs that use the data collected under the DCF (e.g. the FDI, AER etc.) are made aware of the existence of the quality annexes. This would provide the EWGs with useful information on data quality issues as well as feedback to the Member States on the information provided in the quality annexes.

STECF also stresses the increasing emergence of new data needs in addition to the standard data needs for stock assessment, such as discards information for exemptions from the landing obligation, as basis for conservation measures under Union environmental legislations or for Brexit implications related to disaggregation into EEZ zones etc. STECF concludes that as this additional data collection may well go beyond the current DCF/EU-MAP requirements, additional targeted sampling may be required on the national or regional level. STECF notes that under the EU-MAP 2022pp and in the new WP format, MS have the option to include 'test studies' to further explore, develop and test data collection methods. On a regional scale, STECF considers that MS should collaborate and task-share within these additional data collection activities to achieve improved data availability for the needs outlined above.

5.8 EWG 21-18 Technical measures in the Celtic Sea

Background provided by the Commission to the EWG

Celtic Sea cod and whiting are target stocks regulated under the Western Waters Multi-annual plan (WWMAP). Since 2019, when ICES' catch advice showed that cod and whiting stocks in the Celtic Sea are below Blim, only bycatches are allowed for both stocks. As such, and in line with Article 8 of the WWMAP, the Union was legally obliged to adopt remedial technical measures as safeguards, to help rebuild these stocks.

Specific remedial measures were for the first time adopted under Regulation (EU) 2020/123. The measures for cod aimed at improving selectivity by making mandatory the usage of a suit of gears that have lower levels of by-catches of cod in the areas where cod catches are significant, thus decreasing the fishing mortality of that stock in mixed fisheries.

Later in 2020, and for implementation in 2021, the Fisheries Council of December 2020 adopted the "Remedial measures for cod and whiting in the Celtic Sea" under article 15 of the 2021 Fishing Opportunities regulation (EU) 2021/92. These measures aim at continuing the implementation of the measures introduced in 2020, hence to reduce bycatches of gadoids in TACs of species caught in mixed fisheries together with gadoids (e.g. haddock, megrims, anglerfish and Norway lobster), as, without those measures in place, TAC levels of target species should be reduced to ensure that gadoid stocks are able to recover.

Simultaneous to the adoption of these measures, Member States have been carrying out some additional selectivity studies, and France has assessed the biological and socio-economic impact of the raised fishing line and other technical measures in the Celtic Sea but only for French vessels. This was assessed by STECF in March 2020 who concluded that this analysis ideally should be re-run with data from other Member States to ascertain the wider impacts and benefits of the those technical measures (STECF PLEN 20-01).

In the sequence of the above, the North Western Water Member Sates Group have identified the need of increasing the knowledge of the performance of the technical measures for all fleets operating in the Celtic Sea and the benefit of an evaluation of the technical measures adopted in Celtic Sea and emphasizing on the requirement for a bio-economic impact assessment. For that, the NWW MS Group has developed the objectives of the study and launched a data call to collate the necessary data that will underpin the study.

The Commission has positively responded to this request raised by the NWW MS Group, and after that consulted STECF that have also agreed that the work envisaged is comprehensive and warrants dedicating an Expert Working Group to carry out the analysis.

In addition, in June 2021, the UK has notified DG MARE of their intention to introduce new technical measures into the Celtic Sea from the 5th September 2021. These measures will apply in UK waters and differ quite significantly to the current EU measures in place in the Celtic Sea.

With the background of the details provided above, the follow terms of reference have been compiled and are addressed to the STECF.

Terms of Reference for EWG-21-18

Based on the dataset provided by the North-Western Waters MS Group, and the accompanying results prepared by the MS Group; having in mind the objectives of the study as set by the NWW MS Group for an analysis on the remedial technical measures in the Celtic Sea; and lastly, taking into account the STECF PLEN 21-02 advice, notably on guidance and methods to be followed in carrying out these analysis, **EWG 21-18 was requested to**:

ToR 1. As regarding the fleets operating in the Celtic Sea

i) Estimate the contribution of all fleets operating in the Celtic sea to the fishing mortality of all exploited species and in particular F for cod, haddock and whiting.

ii) Evaluation of the conditions of application of specific technical measures trigger by thresholds according to a suit of different catch thresholds (the ones currently implemented by the Union, by the UK, and any other threshold level relevant to be further investigated).

ToR 2. As regarding seasonal closures of relevant parts of the Celtic Sea Protection Zone

i) Evaluate the efficiency of existing closed area for the conservation of cod in ICES divisions 7f and 7g (Regulation (EU) 2019/1241). The analysis should include the efficiency in protecting spawners and juveniles of cod and the economic impact of the closure.

ii) Explore alternative closures in duration, season and/or geography when (if) the current closure is no longer effective. In doing so, the possible displacement of fishing effort to other areas and/or fisheries should be taken into account in the design of new closures.

ToR 3. Conduct a bio-economic impact assessment of adopted technical measures, specifically raised-fishing line, and alternative technical measures. The bio-economic model should integrate all exploited species and all fleets operating in the Celtic Sea and take into account the uncertainty. The technical measures should be evaluated with a simulation study to ensure that they meet the sustainability of the resources (cod, whiting, and all possible target species) and in terms of economic objectives.

ToR 4. Evaluate, to the extent possible, the potential effectiveness of the measures to be introduced by the UK from the 5th September 2021 on cod and whiting stocks in the Celtic Sea in comparison to the current measures in EU waters. Comment on any issues that the differences in measures create.

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 comments

EWG 21-18 met online from the 1st to the 5th of November 2021. The meeting was attended by 13 experts in total, including three STECF members and one JRC staff. One DG MARE representative and six observers (from France, Ireland, Spain and Belgium) also attended the meeting.

STECF observes that the EWG used three data sources to respond to the ToRs: 1) a new and updated dataset of commercial fisheries data that the North-Western Waters (NWW) EU Member States (MS) group collated for 2017-2019 (2020 incomplete), 2) the STECF FDI database 2015-2019 (https://stecf.jrc.ec.europa.eu/dd/fdi) and 3) information from the French EVHOE and Irish IE-GFS surveys from DATRAS database 2009-2020 (https://datras.ices.dk/Data_products/Download/Download_ Data_public.aspx) for ICES stocks cod27.7e-k, whg.27.7b–ce–k, and had 27.7a. The EWG used the approach developed by STECF PLEN-20-01 but extended it to apply the analysis to the Spanish, French, Irish and Belgian commercial data.

STECF notes that all the ToRs were addressed by the EWG, with ToR 3 subdivided in two parts.

STECF notes the following main findings of the EWG by TOR:

ToR 1.1

The bottom otter trawl fleets using larger mesh-size (100-119mm) have the highest partial fishing mortality "F" for cod and haddock, while fleets using smaller mesh-size (70-99mm) contribute more to "F" for whiting. The fishing mortality over the 2015-2019 period peaked in 2017-2018 for cod, 2016 for whiting, and 2017 for haddock. By far, the highest partial F for cod was observed in ICES division 27.7g while the highest fishing mortality for whiting was mostly in 27.7g and 27.7e (e.g. French and UK coastal areas). Fishing mortality for haddock was spread over 27.7e, g, h and a lesser extent in 27.7j.

ToR 1.2

STECF observes that the results from EWG 21-18 showed that there could have been 1805 trips out of 14533 cumulated trips over 2017-2019 potentially impacted by the current 2021 Regulation requiring the use of the raised fishing line gear for trips exceeding 20% of haddock in catch composition (as per article 13 of Regulation (EU) 2020/123 and article 15 of Regulation (EU) 2021/92). This number of impacted trips exceeding 20% of haddock is equivalent or slightly less than the number of trips impacted if a 20% threshold would apply not to haddock but individually to other commercially important species such as megrim, hake, whiting and especially *Nephrops*. More trips would be impacted if this % threshold on haddock was set at a lower level, (i.e. including other trips not targeting haddock only). With the current 20% haddock threshold, the Regulation would only have

impacted France and Ireland, with 1038 trips out of 4152 trips of 80 vessels for France and 767 trips out of 9714 trips of 128 vessels for Ireland in 2017-2019.

The EWG 21-18 static catch threshold analysis also showed that the most appropriate species for setting a catch threshold is indeed haddock, both in terms of catches of cod in tonnes potentially avoided and in terms of negative impact on revenues. The >20% haddock threshold specified in the current Regulation would have impacted fewer trips and vessels while still outperforming the potential thresholds on any other species in terms of potential reduction in cod catches. Compared with the current 20% haddock threshold, a 10% additional increase (>30% haddock threshold) would imply a reduction of the number of trips impacted and of avoided cod catches by 53% and 59%, respectively. On the other hand, with a 10% decrease (>10% haddock threshold) the cod catches would increase by a factor 2.6 and the number of trips impacted by 2.3. In addition, for the equivalent saved cod tonnes, the 20% haddock threshold would have affected less of the trips revenues than a threshold applied on other species.

ToR 2.1

The existing closed areas contained in Annex VI Part C paragraph 2 of Regulation (EU) 2019/1241 (the so-called Trevose closures) do not appear to protect areas with the highest density of cod throughout the year. This is indicated by the survey occurring in year Q4 and by the commercial catches observed during the year. However, a persistent hotspot area (identified over several years) for whiting, and eventually haddock, seems to have occured within the ICES rectangles of the Trevose closure over 2009-2020.

STECF notes that the EWG 21-18 was not able to evaluate the historical efficiency and economic impacts of the Trevose closure because relevant data is not available. The scientific surveys only take place in Q4 while the area is closed during Q1 (February and March) and the commercial data available to the EWG did not include the early years of the closure, which was established in 2005.

ToR 2.2.

EWG 21-18 investigated optimal combinations of ICES rectangles and periods that would provide the highest protection for cod while minimising the effect on short-term revenues. This analysis showed that the fraction of economic returns impacted by a potential catch reduction would increase as expected along with a larger fraction of closed areas. Yet the cod catch would comparatively reduce more. Hence, a 40% cod catch reduction would only imply a 20% reduction in short-term revenue per unit of effort. However, it is anticipated in the report that this decrease in revenue per species per unit of effort, associated with a reduction in cod catches, would be larger for cod than for other species, (i.e. haddock and whiting), primarily because cod catches are associated with areas and fisheries with higher economic returns.

STECF observes that convergent information identified by the EWG supports that substantial catch reductions of cod could be achieved by closing several ICES statistical rectangles off the South Coast of Ireland (Rectangles 31E1, 31E2, 30E0, 30E1, 32E1). These areas should be closed seasonally from the northeast to the south-west following changing cod distribution over the year. However, STECF observes that all the identified closed areas and periods would imply a significant reduction in revenues, and impact some fleets more specifically. This is directly related to changes in the catch opportunities of the relevant fleets. In this regard, STECF notes that until 2019 (with data 2017-2019 being analysed) there seemed to be a high economic dependency of the fisheries on cod. STECF notes though that this is unlikely to be the case since 2020 considering that only bycatch quotas have been allocated, with no directed fishing for cod permitted and remedial

technical measures put in place. These measures are designed to avoid closing cod fisheries prematurely.

STECF notes that the report illustrates that effort displacement could potentially reduce the effectiveness of the proposed closures to reduce catches of cod and whiting significantly. This is particularly the case for cod, where the closures were focused on the Celtic Sea Protection Zone (CSPZ) defined in the Regulation. In this area, fleets would have the ability to allocate fishing effort to the less restricted areas outside the CSPZ. This would potentially reduce the effect of the closures substantially (e.g. where a 60% reduction in cod catches inside the CSPZ would be reduced to 20% in total). On the other hand, the economic returns from displacement may be overestimated as catch rates for the targeted species in the Celtic Sea would most likely decrease in other areas (lower CPUE) if the same fishing effort was concentrated in a smaller area.

STECF notes therefore, that considering the high importance of cod even as a bycatch species, any closure proposal should be accompanied by a reduction in fishing effort overall to effectively reduce unwanted (by)catches, prevent unintended effort displacement and limit inducing increased operating costs and lower economic returns.

ToR 3.1.

STECF observes that EWG 21-18 was only able to conduct a static bio-economic analysis, based on the same approach as used in PLEN 20-01. The results indicated that the implementation of the 'raised fishing line' selectivity device on trawls in the Celtic Sea Protection Zone has a potentially negative short-term economic impact. This impact is estimated higher than an alternative scenario where the fisheries would close following choke species issues (assuming effective implementation of the landing obligation) for the French, Irish and Belgian trawl fleets. In the case of the Spanish fleets, STECF notes that the interpretation of the results of this comparative analysis are less clear since they only catch very limited amounts of cod and haddock.

STECF observes that this assessment of economic impacts, although limited to short-term change in revenue only, still gives useful indications on which combination of reduced cod catches may lead to comparably low reductions in catch of other species.

STECF stresses, however, that the results of the static bio-economic analyses should be interpreted with caution as they do not include mixed fisheries considerations, and do not consider the reallocation of fishing effort or other possible selectivity devices which would reduce cod catches. It is also uncertain whether the calculated losses in revenue would be problematic for the fishing fleets. The EWG was not able to compare the calculated possible losses with economic performance data from the AER for the impacted fleets.

ToR 3.2.

STECF observes that a dynamic bio-economic assessment is considered the better approach to conducting an impact assessment of technical measures. For this purpose, the EWG investigated options to use the fleet-based FLBEIA model, which is being developed for the Celtic Sea in various research projects and by ICES working groups. However, the EWG concluded that the current state of development of this model did not allow exploring management strategies as those discussed by the EWG at this time. More work is required before a fully operational model with appropriate fleet datasets is available. In addition, the FLBEIA model is not spatially-disaggregated, and cannot easily evaluate scenarios of spatial closures, effort displacement or changes in species distribution due to e.g. climate change. STECF notes that an alternative spatially-explicit DISPLACE model was presented to the EWG, which could be investigated and developed further to explore alternative spatial scenarios. STECF further notes that operating several alternative models with

different characteristics and capabilities can be a useful combination to explore a wide range of management options, similarly to what has been carried out in STECF EWGs dealing with the Western Mediterranean management plan (STECF 21-13).

ToR 4.

STECF observes that the measures introduced by the UK are likely to lead to relatively minor adjustments to exploitation patterns compared to the EU measures. The default gear selected by the UK, with a mesh size of 110 mm and 120 mm square mesh panel, is the most selective of the gear options included under the EU legislation (i.e. Technical Measures Regulation 2019/1241 Annex VI). The different *Nephrops* catch threshold, and the prohibition on strengthening bags may have no negative or marginal effect in affecting protection of cod in the Celtic Sea, and therefore on the EU fleet. However, the default 100 mm and 100 mm square mesh panel in ICES divisions 27.7e and 27.7h within UK waters could negatively impact cod catches as the gear has a poorer selectivity with a lower L50 for cod than other gears under EU legislation. On the other hand, the impact of removing the requirement to use the raised fishing line gear is still uncertain. It will impact the selectivity for cod and whiting, but past experience showed that fishers might change the catch species profile to avoid using any alternative device. Finally, the derogation of 80 mm and 120 mm square mesh panels affects a small area where the current abundance of cod and whiting is low.

STECF conclusions

STECF concludes that the EWG 21-18 fully addressed all of the ToRs.

STECF concludes that the approach taken by the EWG is scientifically sound. The data used are the best available and are sufficient to support the methods and findings. However, the outputs from the static approach adopted in TOR 3 are deterministic and hence the precision of the results cannot be fully quantified.

STECF agrees with the conclusion of the EWG for TOR 1 that, based on historical 2017-2019 catch data:

- The trawlers fleets using larger mesh-size (100-119mm) have the highest partial Fs for cod and haddock, while smaller mesh-size (70-99mm) contributes more to whiting.
- the most appropriate species for setting a catch threshold is indeed haddock in terms of cod tons covered and the smallest expected impact on revenue.
- The specific >20% haddock threshold specified in the current Regulation impacts fewer trips and vessels while still outperforming the potential thresholds on any other species.

STECF concludes that for TOR 2,

- closing ICES statistical rectangles off the Central Irish South Coast (31E1, 31E2, 30E0, 30E1, 32E1), with a northeast south-westwards trend throughout the year, would decrease cod catches.
- The potential for effort displacement may though significantly reduce the effectiveness of the CSPZ closures in reducing catches of cod and whiting.

Considering the historically high dependency of the fisheries on cod catches, any closure proposal would thud need to be accompanied by a reduction of fishing pressure overall to effectively reduce unwanted (by)catches, prevent unintended effort displacement and limit inducing increased operating costs and lower economic return.

STECF concludes for TOR 3 that:

in terms of short-term losses, and in the absence of any fleet adaptation, the implementation of the 'raised fishing line' selectivity device on trawls in the CSPZ would have the same magnitude of impact as the early closure of the fishery for some fleets, noting this is based on a limited static assessment.

- the application of a dynamic bio-economic model to conduct a medium-term assessment would be beneficial. More work should be dedicated to operationalising current fleet-based FLBEIA model and further exploring the spatially-explicit DISPLACE model.

Finally, in relation to TOR 4 STECF concludes that the measures introduced by the UK are likely to lead to relatively minor adjustments to exploitation patterns compared to the EU measures.

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

6.1 Joint Recommendation of BALTFISH on Technical Measures to reduce cod bycatch and protect cod stocks

Background provided by the Commission

The BALTFISH High Level Group have provided a Joint recommendation establishing technical conservation measures for the protection of the Baltic cod stocks by introducing a range of selective devices. These devices include a modified T90 codend, square mesh codend and "ROOFLESS" selection device, the details of which are provided in the attached Joint recommendation.

Therefore the STECF is asked to analyse the selectivity benefits of the attached Joint Recommendation, paying special attention to consistency with the provisions Article 15(4) (5) and (6) of Regulation 2019/1241 and achieving the objectives and targets set out in Articles 3 and 4 of Regulation 1241/2019. Furthermore, STECF should consider whether the specific elements contained in the Joint Recommendation aimed at the protection of Baltic cod offer benefits in terms of selectivity improvements to those currently specified and in operation. There should be a specific analysis of the options, the robustness of the data cited and the associated proposed reductions in cod bycatches.

Request to the STECF

The STECF is requested to:

1. Assess compatibility of the proposed technical measures with the objectives and conditions set out in Articles 15(4) (5) and (6) of Regulation 2019/1241 and achieving the objectives and targets set out in Articles 3 and 4 of Regulation 2019/1241. In particular whether they are of similar or better selectivity characteristics than the baseline gears, comparing the selectivity characteristics of the proposed measures for the protection of Baltic cod and assess whether the measures proposed in the JR offer benefits in terms of size and species selectivity.

2. Assess to what extent these devices improve the by-catch reduction of cod by at least 55% compared to existing baseline gears defined in Annex VIII, Part B, point 1.1 TM Regulation.

3. Comment on the technical design specifications of the gear options tested and possibly suggest modifications to the designs that may improve size and species selectivity in the fishery concerned.

4. Assess whether the materials, methods and statistical analysis used to test the gear options may be considered adequate and fit for purpose, and whether the data and information submitted are considered robust and sufficient to allow a full analysis of their relative effectiveness.

Summary of the information provided to STECF

Background documents are published on the meeting's web site on: https://stecf.jrc.ec.europa.eu/plen2103

The following documents were provided to PLEN 21-03 to support this request:

Joint Recommendation of the BALTFISH High Level Group- "Technical measures for Baltic Demersal Trawl fishery to reduce cod bycatch and protect cod stocks".

The JR was supplemented with 8 annexes:

1. Technical approaches to avoid cod catches in Baltic Sea trawl fisheries by D. Stepputis, J. Santos and C. Zimmermann. Report. April 2020.
2. Fact sheet Bacoma 105/120 mm codend (reference/baseline codend- Ref Bacoma),
3. Fact sheet T90 125 mm / two panel codend (not proposed in JR),
4. Fact sheet 125 mm square mesh codend (alternative codend in JR- SMC_125),
5. Fact sheet T90 125 mm / two panel + lastridge ropes codend (alternative codend in JR- T90_125_2P_LR),
6. Fact sheet ROOFLESS escape device (alternative net section in JR- RL 175)
7. Technical descriptions of the proposed selection devices (SMC_125, T90_125_2P_LR and RL 175),
8. Table summarizing cod catch efficiency (in numbers and weight) for the proposed gear options per SD. Catch efficiencies are presented both in absolute terms and relative to the current baseline gears.

Summary of JR request

The joint recommendation from BALTFISH regional group recommends in ICES subdivisions 22-26 the following derogations from baseline reference gears and from special mesh size allowances for flatfish fisheries (the Point 1.1. and Point 1.2. of the Part B of the Annex VIII in EU 2019/1241, including trawls specified under Point 1.2. (ii) in the Commission delegated Regulation 2018/47):

1. When fishing for flatfish in ICES subdivisions where targeted cod fisheries are prohibited the use of the following selective demersal trawls specified in point 4.3.1 (see paragraph "*Overview description of the gear options in the JR*" below*)*. of this Joint Recommendation shall be mandatory:
    a) in subdivision 22 and 23 only selective demersal trawls specified in point 4.3.1.3 (ROOFLESS), including 4.3.1.2 (125 mm Square mesh codend) in combination with 4.3.1.3);
    b) in subdivisions 24 – 26 only selective demersal trawls specified in point 4.3.1.1 (125 mm T90 with lastridge ropes) and trawls specified in 4.3.1.3-(ROOFLESS), including 4.3.1.2 (125 mm Square mesh codend- in combination with ROOFLESS selection device)

These selective demersal trawls have been shown to reduce the bycatches of cod in weight by on average at least 55 % compared to the baseline reference gears which are specified in the Point 1.1 of the Part B of the Annex VIII of the Regulation (EU) 2019/1241.

2. Any further demersal trawls selectivity modifications in fisheries for flatfish shall result in at least 55 % reduction on average in weight of cod catches compared to

the baseline reference gears which are specified in the Point 1.1 of the Part B of the Annex VIII of the Regulation (EU) 2019/1241.

3. The Commission should be requested for each case of demersal trawls modifications to ensure the assessment whether the selective effect of the new demersal trawls or trawl modifications are effectively controllable and include in the relevant delegated act only effectively controllable trawls or trawl modifications.
4. In ICES subdivisions 27-32 baseline reference towed gears described in the Point 1.1. of the Part B of the Annex VIII of the Regulation (EU) 2019/1241 can still be used.

Periodical evaluation of the selectivity parameters

By 1 April 2023 and in future years as appropriate, BALTFISH Member states having a direct management interest in flatfish fishery in respective areas shall provide the Commission with scientific data and information allowing an assessment of the impact of length structure of the cod stocks on the selectivity parameters of alternative demersal trawls, i.e. that the stipulated reduction efficiency in weight of cod resulting from this Joint Recommendation is still upheld.

The Scientific, Technical and Economic Committee for Fisheries (STECF) shall be asked to assess the information referred to in the paragraph above by the 1 August 2023 at the latest.

BALTFISH Member states will provide the necessary information and the Commission is therefore requested to ensure annually, starting from the third year of application, an evaluation of the impact of the length structure of the cod stocks in the Baltic Sea for the alternative demersal trawls referred to in this Recommendation.

Recording of cod bycatches

Member States concerned shall ensure that total catches and cod bycatches taken by the alternative demersal trawls described in this Recommendation are recorded separately from catches taken by other fishing gears.

Overview description of the gear options in the JR (entitled point 4.3.1 in the JR)

1) Modified T90 codend. Modifications of the current T90 codend (Regulation (EU) 2019/1241) are as follows:
   - an increase in the minimum mesh size from 120 mm to 125 mm, and
   - reinforcement of the selvedges with lastridge ropes.
2) Square mesh codend (only in combination with ROOFLESS selection device). Constructed of 2 panels with the same netting material as the escape window of the current BACOMA codend (Regulation (EU) 2019/1241), and a minimum mesh size of 125 mm with mounted ROOFLESS selection device.
3) ROOFLESS selection device. An escape opening established on top of a four-panel extension piece of any baseline reference gear or any new alternative gear to provide escape opportunities for cod before it enters the codend.

Legal technical descriptions of the gears were provided in Annex 7.

Description of annexes

Annex 1 is a technical report by scientists from the Thünen Institute of Baltic Sea Fisheries that summarizes gear trials performed since 2019 and aimed to reduce cod catches in Baltic trawl fisheries. The report also summarizes earlier gear research carried out at the institute. The authors note that the report is meant to update and complement the ICES report 'Technical strategies to avoid catches in the Baltic Sea trawl fisheries' (ICES, 2019). Both works presented in annex 1 and the ICES report were reportedly initiated in response to the deteriorating status of Baltic cod stocks and the subsequent decision to end directed fisheries for Eastern Baltic cod in 2019.

Since the 2019 closure, German gear research has focused on two alternative approaches: (1) modifications of the trawl extension piece and (2) codend modifications.

In approach 1, two different selectivity devices were developed and tested: (a) "ROOFLESS" - the top panel of the trawl extension was removed to build a large rectangular escape opening (175 cm, or 330 cm long) and (b) "Codex" - a guiding panel in the extension of a trawl guides cod towards a different type of escape opening than the ROOFLESS design. In both trials the devices were mounted in a 4-panel section extension (called "Nemos"). The report shows that both designs reduce bycatch of cod effectively and that the catch efficiency for flatfish was higher for ROOFLESS than for Codex. The authors conclude that ROOFLESS 175 (escape opening 175 cm long) is a good compromise between catch reduction of cod (75% independent of cod length), no statistically significant catch reduction of flatfish, and the simplicity of construction. They also conclude that a further increase in catch reduction of cod could be achieved when combining ROOFLESS with a modified codend (see approach 2 below). The ROOFLESS trials were done on two research cruises (21 hauls), where fishing was conducted during daytime.

Approach 2 focused on evaluations and tests of variants of codend designs previously trialed or used in the directed Baltic cod fishery. The variants tested were well-known codend designs, i.e. baseline gears such as Bacoma and T90 but also square mesh codends, but with increased mesh size. The trials showed that even a small mesh size increase can result in a relatively large reduction of cod catches, because the cod size distribution is dominated by individuals around the selective range of the tested gears. Results also showed that full square mesh codends are less selective for flatfish, hence retain more small flatfish than the other tested codend designs. This is due to the mismatch of fish morphology and mesh configuration. Consequently, no loss of commercially sized flatfish was found for the square mesh codend. One gear option that is highlighted is an increase of the mesh size of the current baseline T90 codend from 120 mm to 127 mm. This would (given the cod size structure used in the simulation exercise) reduce the cod catches to 50% with a flatfish loss of 14%. Mostly catch of small and medium sized cod is reduced by this option. The authors point out that the simulation, which is based on selectivity estimates and cod population size structure derived from scientific surveys (extracted from ICES DATRAS database), needs to be interpreted with caution as:

- The simulation is based on a "static picture" of the exploited fish populations. The effect of codend size selectivity on catches would vary under variations in the population structure. For example, an increased abundance of large cod would lead to an increase in cod catch.

- The simulations only consider population-average selectivity patterns, and do therefore not account for variations in selectivity and in population structure often occurring even between hauls on the same fishing trip.
- The selectivity properties of four out of ten codend designs considered in the simulation were experimentally quantified; among those four were the two codends proposed in the current JR (T90 125 mm and 125 mm square mesh codend). However, the selectivity from the remaining six designs was estimated theoretically using a model, but without experimental data. Such experiments were planned but were canceled due to covid-19 measures.

Annexes 2-6 are short fact sheets that summarize all relevant data and information of the different selection devices of relevance for the current JR (except annex 3 which is not a proposed alternative in the JR). These fact sheets have a similar structure under the headlines: general description, basic functional principle, experimental data, selectivity estimates, performance indicators (by sub-division), results and summary.

Annex 7 is detailed technical description of the three alternative selection devices proposed in the JR.

Annex 8 is a summary table of the simulated reduction in cod catch efficiency by area (SD 22, SD 24 and SD 25-26) and gear option. The cod catch reduction efficiency is calculated based on estimated catches of the proposed gear options compared to estimated catches of the current two baseline gears (Bacoma 120/105 mm and T90 120 mm). The input data for the simulations consists of selectivity of the different gears and cod population size structure by area (using Datras survey data from Q4 2019 and Q1 2020). The summary table shows a strong impact on catch reduction efficiency of the underlying population structure for the two codend alternatives and much less so for the ROOFLESS alternative. The difference is driven by the different selectivity patterns between the codend alternatives (traditional logistic size-dependent selectivity) and the ROOFLESS alternative (size independent selectivity).

Table 6.1.1. A summary table of estimated cod reduction efficiency per gear option and area (provided as annex 8 to the JR).

Annex 8 to the BALTFISH High level group Joint Recommendation Technical measures for Baltic demersal trawl fishery to reduce cod bycatch and protect cod stocks

Catch efficiency for cod by numbers (upper table) and by weight (lower table) for different selective device options compared to the reference gears (shaded light grey). *Catch efficiency for cod in weight reductions relative to the reference gears highlighted with yellow frame for better readability. Catch efficiency for cod in weight reductions under the 55 % selectivity threshold shaded in dark grey. The SMC can only be used combined with ROOFLESS due to its insufficient selectivity.*

Catch efficiency for cod (in numbers)[2]

		SD22			SD 24			SD 25-26		
Gear ID	Gear option	Absolute catch efficiency	Reduction relative to Ref. Bacoma	Reduction relative to Ref. T90	Absolute catch efficiency	Reduction relative to Ref. Bacoma	Reduction relative to Ref. T90	Absolute catch efficiency	Reduction relative to Ref. Bacoma	Reduction relative to Ref. T90
Ref. Bacoma[3]	base	47 (40–56) %	-	-	17 (13–23) %	-	-	16 (12–22) %	-	-
Ref. T90[4]	base	55 (52–57) %	-	-	16 (13–20) %	-	-	14 (9–18) %	-	-
Mod. T90[5]	1	37 (53–63) %	22 (6–36) %	33 (25–39) %	5 (4–6) %	71 (60–79) %	69 (56–76) %	3 (2–5) %	81 (69–88) %	77 (58–84) %
SMC[6]	2	43 (38–48) %	8 (0–27) %	21 (11–31) %	9 (6–14) %	48 (9–69) %	46 (9–66) %	7 (4–13) %	56 (12–77) %	47 (0–72) %
ROOFLESS[7]+Ref. Bacoma	3+base	12 (7–21) %	75 (59–84) %	78 (62–86) %	4 (3–8) %	75 (59–84) %	73 (51–84) %	4 (2–7) %	75 (59–84) %	69 (39–82) %
ROOFLESS+Ref. T90	3+base	14 (9–22) %	70 (51–82) %	75 (59–84) %	4 (2–7) %	76 (59–87) %	75 (59–84) %	3 (2–6) %	79 (62–90) %	75 (59–84) %
ROOFLESS+Mod. T90	3+1	9 (6–15) %	80 (69–87) %	83 (72–89) %	1 (1–2) %	93 (73–96) %	92 (85–95) %	1 (1–2) %	95 (90–97) %	94 (87–97) %
ROOFLESS+SMC	3+2	11 (7–18) %	77 (61–86) %	80 (67–87) %	2 (1–4) %	87 (73–93) %	86 (72–93) %	2 (1–4) %	89 (75–95) %	87 (67–94) %

Catch efficiency for cod (in weight)

		SD22			SD 24			SD 25-26		
Gear ID	Gear option	Absolute catch efficiency	Reduction relative to Ref. Bacoma	Reduction relative to Ref. T90	Absolute catch efficiency	Reduction relative to Ref. Bacoma	Reduction relative to Ref. T90	Absolute catch efficiency	Reduction relative to Ref. Bacoma	Reduction relative to Ref. T90
Ref. Bacoma	base	81 (70–92) %	-	-	32 (27–42) %	-	-	23 (19–32) %	-	-
Ref. T90	base	91 (88–93) %	-	-	36 (31–40) %	-	-	23 (18–28) %	-	-
Mod. T90	1	72 (66–76) %	12 (0–24) %	22 (15–27) %	14 (12–17) %	56 (44–67) %	60 (50–66) %	6 (5–8) %	73 (62–81) %	73 (60–80) %
SMC	2	80 (74–84) %	1 (0–15) %	12 (6–19) %	21 (15–28) %	36 (4–58) %	43 (18–58) %	12 (7–19) %	51 (12–72) %	50 (13–70) %
ROOFLESS+Ref. Bacoma	3+base	21 (13–34) %	75 (59–84) %	77 (62–86) %	8 (5–15) %	75 (59–84) %	77 (58–86) %	6 (4–11) %	75 (59–84) %	74 (52–85) %
ROOFLESS+Ref. T90	3+base	23 (15–38) %	71 (53–82) %	75 (59–84) %	9 (6–15) %	72 (53–84) %	75 (59–84) %	6 (4–10) %	75 (58–86) %	75 (59–84) %
ROOFLESS+Mod. T90	3+1	18 (12–29) %	77 (63–86) %	80 (68–87) %	4 (2–6) %	89 (81–93) %	90 (83–93) %	2 (1–3) %	93 (87–96) %	93 (87–96) %
ROOFLESS+SMC	3+2	20 (13–33) %	75 (58–84) %	78 (63–86) %	5 (3–9) %	84(71–91) %	85 (73–92) %	3 (2–6) %	87 (74–94) %	87 (73–93) %

[2] The catch efficiencies presented consider cod population structures, using survey data from quarter 4 of 2019 and quarter 1 of 2020 (DATRAS-database).
[3] Reference Bacoma codend with 105 mm nominal mesh size and a 120 mm mesh size Bacoma escape window.
[4] Reference T90 codend with 125 mm nominal mesh size.
[5] Modified T90 codend with 125 mm nominal mesh size and lastridge ropes.
[6] Square mesh codend with 125 mm nominal mesh size.
[7] ROOFLESS tunnel with 175 cm opening length.

STECF comments

Robustness of the information provided

STECF acknowledges that the information on the selectivity trials is presented in a clear and structured manner; especially the fact sheets and summary table provided in the annexes are worth commending. Furthermore, the methodology of the underpinning studies (design, sampling, analyses) is scientifically robust and follows common guidelines and practices for conducting selectivity and catch comparison trials and analyses.

STECF notes, however, that the number of trials for the proposed gear options in the JR is somewhat limited. Also, the conditions under which the sea trials were conducted are limited in terms of haul duration, catch size variation, depth range etc. In particular, STECF considers that a potentially important limitation, also described in annex 1, is that the ROOFLESS trials were all undertaken in daylight conditions. As diurnal behavioural differences and the importance of visual cues are known factors that may influence the effectiveness of escape openings, the effectiveness of the ROOFLESS device is uncertain during the night (both for cod and flatfish) and further research on the impact of light conditions on the effectiveness would be valuable. This is an important knowledge gap as the fishery normally takes place during both day and night.

Despite these limitations, STECF considers though that the nature of the proposed new gear options (increased mesh size and/or a large opening in the top sheet) suggests that for cod it is safe to assume that their selectivity characteristics are at least equivalent to the baseline gears and that catches <MCRS will be reduced.

STECF acknowledges furthermore that these limitations of the gear trials should be taken in the context of the relatively recent change in focus towards measures to exclude cod in flatfish fisheries caused by the depletion of the Baltic cod stocks resulting in a prohibition of targeted fisheries since 2019. Up to 2016, focus in the Baltic was on excluding flatfish from cod fisheries because the small quotas for plaice potentially choked the fisheries for cod (Zimmermann et al., 2015); after that, while the cod stocks deteriorated, the plaice stocks have increased (ICES, 2020). Also, Annex 1 explains that additional planned sea trials had to be cancelled due to Covid-19 measures.

STECF notes that from the evidence presented, the largest improvement in size and species selectivity would be achieved if a combination of gear options 1 (modified T90) and 3 (ROOFLESS) were implemented. For flatfishes like plaice and flounder on the other hand gear option 2 (square mesh codend) is likely to reduce selectivity and increase catches of undersized fish, whereas the two other gear options exhibit equivalent or somewhat improved selectivity compared to the current baseline gears with limited losses of flatfish of commercial sizes (around 10%).

Comments on the 55% reduction threshold target and the impact of varying population structure

STECF understands that the catch reduction limit of cod by at least 55% (in weight) stipulated in the JR is an arbitrary target, the basis of which is unclear. As a matter of comparison, STECF notes that the TAC reductions since 2019 (the last year of directed cod fishing on both stocks) have been by 98% and 95% for Eastern and Western Baltic cod stocks respectively, well in excess of the 55% catch reduction. The proposed catch reduction limit could reflect a wish to allow the use of the modified T90 codend in subdivisions 24-26 (which has an average reduction efficiency of 56%). STECF considers though that the introduction of gears with a higher cod reduction efficiency than the 55% limit would be more beneficial for the cod stocks and for the possibility to comply with the landing obligation (which is a stated aim in the JR). Furthermore, according to the studies provided, a larger reduction of cod catches can be achieved without significant losses of flatfish catchability by one of the other proposed gear options.

STECF notes furthermore that the JR considers the aimed reduction to be higher than 55% in average, without considering the uncertainty of the estimated average. According to the results presented, the confidence interval for the least selective option is 44-67%, implying that in a substantial number of hauls, the reduction of cod catches amount to less than the stipulated 55%. In similar situations (when asked whether catch reduction exceed stipulated limits), STECF has previously used bootstrapping to estimate the risk that the individual trips exceeded the limit (e.g. STECF PLEN 21-02 and STECF PLEN 11-03).

This uncertainty is especially important in the context of varying cod population structure. STECF notes that the scientific evidence provided suggests that the proposed gears per subdivision all exhibit an average cod reduction of 56% or more. However, there are notable differences in how sensitive the cod reduction efficiency of the three gear options is to changes in cod population size structure. Gear options 1 and 2, which both essentially are similar to the current cod gears but with somewhat increased mesh size, exhibit very

large variation in reduction efficiency between areas, in some cases with no reduction at all (range 1-73%) whereas gear option 3 is both more consistent (smaller range interval), and with higher reductions in cod catches (71-93% depending on the codend used in combination). STECF understands that these differences are driven by different selectivity characteristics so that cod larger than approximately 40 cm are still likely to be caught with options 1 and 2 (most cod >50 cm being retained), while option 3 releases the majority of cod independent of size. Related to this, the Eastern and Western Baltic cod stocks have had a more truncated size structure since 1991. The current low proportion of larger cod in the Eastern stock is unprecedented and individual growth is impaired (Svedäng & Hornborg 2017, ICES 2021). Considering evidence that large individuals are potentially important for stock productivity and reproductive capacity and given the importance of the role of large predators for ecosystem structure and function (Svedäng & Hornborg 2017, Charbonneau et al. 2019), STECF considers it precautionary to reduce substantially all sources of mortality on larger cod in order to support the recovery of the Eastern stock.

Comments on the proposed annual update of gear evaluation

STECF understands the thought behind the JR to now introduce, and subsequently to regularly re-evaluate, allowed gear options so that they uphold the target reduction of cod catches to at least 55%. Upholding the target will indeed depend on the future size structure of the fished populations and this is accounted for in the plan through its stipulation to re-evaluate annually, based on population structure data, whether the target reduction still upholds. STECF notes that this quantitative target based objective (to uphold at least 55% cod reduction) in the JR is somewhat different from more usual and more qualitative ways to formulate objectives for introducing new gear selectivity measures (typically formulated as unquantified increase selectivity, reduce catches <MCRS etc) which are independent of population size structure. STECF commends the approach taken in the sense that it is quantitative and includes an evaluation strategy, but considers that there are also shortcomings with this approach: The underlying population data used in this JR is from Q4 2019 and Q1 2020. This means that at the time the JR is implemented via a delegated act, underlying cod size data is already at least two years old (and will be over three years old by the time of the first planned revision in 2023 and four years old if and when a revised legislation is in place). The size distribution of cod populations can be expected to change substantially over such a time span meaning that the realized effects on cod catches will be unknown (for gear options 1 and 2). Further, STECF considers that recurrent yearly revisions of gear performance due to changing cod population structure (and also possibly revisions of gear regulations) will require resources from many participants of the management cycle.

Therefore, STECF considers that a simpler option, that would also be more robust both biologically and from a management perspective while still fulfilling the JR-objectives, would be to solely consider the introduction of gear option 3 in all areas (not only in SD 22-23). An introduction of this gear, ideally in combination with codend option 1, would effectively decouple cod catch reduction efficiency from future changes in size structure of the cod populations. This means that there would be no need for annual follow-up and revisions of legislation. The possibility to catch flatfish will, according to the studies provided, be similar to the current proposal and the same rules would be applicable in all subdivisions, which should ease control and reporting as well as reduce risks of unintended consequences caused by different incentives in different areas.

Additional comments

STECF notes that all gear options are of low to medium complexity. Costs for fishers to modify existing gears can be considered limited (800-2000 Euros), although STECF acknowledges that most demersal fisheries in the Baltic are struggling with economic hardship due to the reduction of fishing opportunities in recent years.

STECF considers that the technical specifications are very detailed and provide all information needed for implementation and for legislative purposes.

STECF notes that the JR states that concerned Member States should ensure that cod bycatches taken by the proposed new demersal trawls are recorded separately from catches taken by other fishing gears. According to the JR the baseline gears can still be used in area 27-32. STECF notes that if fishing grounds within area 22-26 as well as within 27-32 are covered in the same fishing trip, there is a risk of gear misreporting. Measures to restrict fishing activity to area 22-26 in the same fishing trip coupled with a prohibition to carry any other active gears onboard while fishing in these areas, would improve the accuracy of reported catch per gear.

STECF conclusions

Assess whether the materials, methods and statistical analysis used to test the gear options may be considered adequate and fit for purpose, and whether the data and information submitted are considered robust and sufficient to allow a full analysis of their relative effectiveness

STECF concludes that the information provided is adequate, scientifically robust and follows common guidelines and practices for conducting selectivity and catch comparison trials and analyses and allowed a full analysis of the proposal.

Assess compatibility of the proposed technical measures with the objectives and conditions set out in Articles 15(4) (5) and (6) and achieving the objectives and targets set out in Articles 3 and 4 of Regulation 2019/1241

STECF concludes that the selectivity characteristics of all proposed gears for cod are at least equivalent to the baseline gears and that catches <MCRS will be reduced compared to the current baseline gears. For flatfish species like plaice and flounder selectivity is expected to be similar to the current situation, except for gear option 2 (125 mm square mesh codend) for which a reduced selectivity and increased catches of undersized fish is expected.

Assess to what extent these devices improve the by-catch reduction of cod by at least 55% compared to existing baseline gears

STECF concludes that, given the cod size structures used in the scientific evidence, all of the proposed gear options would reduce cod catches by at least 55% (on average).

However, for gear options 1 (modified T90) and 2 (square mesh codend) the cod reduction efficiency will change with changes in cod size structure and a substantial number of hauls will not meet the reduction requirements. In contrast for gear option 3 (ROOFLESS) cod reduction efficiency is higher (75%) and more likely to consistently meet the required reduction, being independent of cod size structure.

STECF concludes that the proposal to introduce two gear options that are size selective has weaknesses related to the variability of cod population size structure over time. STECF concludes that introducing gear option 3 (ROOFLESS) as the only allowed option in all areas would be more beneficial. This would uncouple the cod reduction effectiveness from changes in cod population structure, thus making regular revision less essential. STECF considers this a more robust strategy from an ecological, biological and management perspective.

STECF concludes furthermore that combining gear option 3 (ROOFLESS) with gear option 1 (modified T90) is the most effective for reducing cod catches of the options and combinations thereof presented. This gear combination would provide most biological benefits in all areas, with only limited losses of flatfish.

Comment on the technical design specifications of the gear options tested and possibly suggest modifications to the designs that may improve size and species selectivity in the fishery concerned

STECF concludes that the technical specifications are detailed and sufficient for implementation purposes.

STECF concludes however, that irrespective of which gears are chosen for future legislation, more selectivity studies of the proposed gears would be beneficial. This is especially applicable for gear option 3 (ROOFLESS) for which the influence of light conditions for the selectivity characteristics is uncertain.

STECF concludes that measures to restrict fishing activity to area 22-26 in the same fishing trip coupled with a prohibition to carry any other active gears onboard while fishing in these areas, would improve the accuracy of reported catch per gear.

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6.2 Review of national management plan for bottom trawlers in certain territorial waters of Greece

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 of the coast or within the 50m isobath where that depth is reached at a shorter distance from the coast. Furthermore, in accordance with Article 13(2) of MedReg, the use of trawl nets shall be prohibited within 1,5 nautical miles of the coast. By way of derogation from Article 13(2) and at a request of a Member State, the use of trawl nets between 0,7 and 1,5 nautical miles off the coast shall be authorised subject to some conditions.

In addition, 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. Under this provision, Member States are expected to adopt management plans for fisheries conducted by trawl nets, boats seines, shore seines, surrounding nets and dredges within their territorial waters.

In 2013, the Common Fisheries Policy (CFP) introduced new elements for conservation such as the target of maximum sustainable yield (MSY) for all the stocks by 2020 at the latest, the landing obligation and the regionalization approach.

In line with these two regulations, the plans shall be based on scientific, technical and economic advice, and shall contain conservation measures to restore and maintain fish stocks above levels capable of producing MSY. Where targets relating to the MSY (e.g. fishing mortality) cannot be determined, owing to insufficient data, the plans shall provide for measures based on the precautionary approach, ensuring at least a comparable degree of conservation of the relevant stocks.

The plans may contain specific conservation objectives and measures based on the ecosystem approach to achieve the objectives set. In particular, it may incorporate any measure included in the following list to limit fishing mortality and the environmental impact of fishing activities: limiting catches, fixing the number and type of fishing vessels authorized to fish, limiting fishing effort, adopting technical measures (structure of fishing gears, fishing practices, areas/period of fishing restriction, minimum size, reduction of impact of fishing activities on marine ecosystems and non-target species), establishing incentives to promote more selective fishing, conduct pilot projects on alternative types of fishing management techniques.

In June 2021, the Greek Administration has requested the revision of the existing national management plan for bottom trawlers (OTB) in certain territorial waters of Greece. The revised plan:

(a) prolongs the existing national management plan for bottom trawlers (OTB) and concerns 255 fishing vessels,

(b) introduces a derogation for bottom trawlers (OTB) regarding the minimum distance from the coast (zone between 1 to 1,5 nm from the coast), in certain territorial waters of Greece in the Aegean Sea and Ionian Sea (GSAs 20, 22 and 23), in accordance with Article 13(11) of MedReg. The derogation refers to certain areas of the Greek territorial waters and reference is made to excluded areas. The areas subject to a derogation for trawling in the zone between 1 to 1,5 nm from the coast, are defined with geographical coordinates (in progress). The derogation will allow bottom trawlers to operate only from 1 January to 15 May and 1 October to 23 December annually,

(c) includes additional restrictive management measures due to the derogation request,

(d) envisions a scientific monitoring plan and annual stock assessment (*Merluccius merluccius, Mullus surmuletus, Mullus barbatus, Spicara smaris, Parapenaeus).*

Request to the STECF

STECF is requested to review and make any appropriate comments and recommendations on the updated national management plan for the trawl fisheries in certain Greek territorial waters, and its supporting elements.

In particular, STECF is requested to:

TOR 1. Advise and assess whether the national management plan for trawlers in certain waters of Greece contains adequate elements in terms of:

1.1. The description of the fisheries

- Biological characteristics and state of the exploited resources with reference in particular to long-term yields.
- Description of the fishing pressure and measures to accomplish a sustainable exploitation of the main target stocks.
- Data on catches (landings and discards) of the species concerned, fishing effort and abundance indices such as catch-per-unit-effort (or CPUE).
- if possible, catch composition in terms of size distribution.
- Information on the social and economic impact of the measures proposed.
- Potential impact of the fishing gear on the marine environment with particular interest on protected habitats (i.e. seagrass bed, coralligenous habitat and maërl bed);

1.2. Objectives, safeguards and conservation/technical measures

- Objectives that are consistent with the objectives set out in Article 2 and with the relevant provisions of Articles 6 of CFP Regulation and quantifiable targets, such as fishing mortality rates and total biomass.
- Objectives for conservation and technical measures to be taken in order to achieve the targets set out in Article 15 of Regulation (EU) No 1380/2013, and measures designed to avoid and reduce, as far as possible, unwanted catches.
- Measures proportionate to the objectives, the targets and the expected time frame.

- Safeguards to ensure that quantifiable targets are met, as well as remedial actions, where needed, including situations where the deteriorating quality of data or non-availability places the sustainability of the main stocks of the fishery at risk.
- Other conservation measures, in particular measures to gradually eliminate discards, taking into account the best available scientific advice or to minimise the negative impact of fishing on the ecosystem.

1.3. Other aspects:

- Quantifiable indicators for periodic monitoring and assessment of progress in achieving the objectives of the plan.

TOR 2. Evaluate whether the following conditions set by the MedReg are fulfilled:

2.1 Derogation to the distance from the coast (Article 13 – Paragraphs 2 and 11)

- The sea-depth shall not be less than the 50 metres isobaths;
- There are particular geographical constraints, such as the limited size of coastal platforms along the entire coastline of the Member State or the limited extension of trawlable fishing grounds;
- The fisheries have any significant impact on the marine environment;
- The fishing activities fulfil the requirements of Article 4 of the Mediterranean Regulation;
- The fisheries and do not contain any increase in the fishing effort with respect to what is already authorized by Member States;
- The fisheries are subject to a management plan and carry out a monitoring of catches as requested in Article 23;
- The fisheries do not interfere with the activities of vessels using gears other than trawls, seines or similar towed nets;

2.2 Evaluate any additional information and documents provided to support the Greek request to update its management plan.

Summary of the information provided to STECF

Background documents are published on the meeting's web site on: https://stecf.jrc.ec.europa.eu/plen2103

Five documents were provided to STECF, which are summarized below.

- *Revised Management Plan for the Greek bottom otter trawl fisheries*

This is a revised version of the management plan for bottom otter trawl fisheries in specific areas of Greece. It contains the main outlines of the Greek bottom trawl fisheries, proposing an updated management plan aiming at improving the exploitation of the demersal resources in GSAs 20, 22 and 23 and including aspects related to the environmental impact of this fishery, as well as an evaluation of the economic impact of the proposed management measures.

- *Official letter from Greece on the Submission of a proposal for revision of management plan for fishing with bottom otter trawls or trawlers (OTB) in specific areas of Greece*

This is the request from the Greek Administration for an extension of the application of the previous management plan, with additional restrictive management measures and implementation of a derogation from the minimum distance from the coast that vessels flying the Greek flag may operate with bottom otter trawls (OTB) in specific areas within Greek territorial waters.

- *Draft Ministerial decision for enforcing a management plan for bottom otter trawls fisheries (OTB) in specific areas of Greece*

This is the draft Ministerial decision of the Greek Administration for enforcing the management plan for bottom otter trawls fisheries (OTB) in specific areas of Greece, in application of Article 19 of Council Regulation (EC) 1967/2006 on management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea. Three Annexes are mentioned in this document, but only Annex I and Annex II are provided. Annex III should have included spatial information on the fishing areas for which derogation is asked (from 1.0 nm from the coast), but was missing from the original document.

- Annex I

This Annex includes the technical features of all the 255 active vessels allowed to use bottom otter trawl in territorial waters of Greece.

- Annex II

This annex includes all the areas inside the territorial waters of Greece where fishing activities are regulated. The annex includes the prohibition period (months) and the reference to the legal framework for the year of issue.

STECF comments in relation to each of the elements outlined in the ToRs

A previous MP was reviewed by STECF in 2013. PLEN 13-02 was unable to evaluate whether the MP was likely to deliver the stated objectives of maintaining the stocks at levels consistent with MSY objectives, as it was not possible to reliably assess stock status in terms of spawning stock biomass and fishing mortality with the available data and information.
In addition, the MP did not prescribe any explicit harvest control rules to ensure future sustainable exploitation rates.
STECF PLEN 13-02 also considered that as several of the stocks were also exploited by other (EU and non-EU) countries, and advised that an up-to-date assessment should be conducted including fishery-dependent data from such countries.

TOR 1. Advise and assess whether the national management plan for trawlers in certain waters of Greece contains adequate elements in terms of:

1.1. The description of the fisheries

- *Biological characteristics and state of the exploited resources with reference in particular to long-term yields*

STECF notes that Greece has provided the ratio F/Fmsy for the five most important demersal stocks (i.e., hake, red mullet, striped red mullet, deep-water rose shrimp, and picarel).
STECF acknowledges the effort by the Greek Administration to provide estimates of stock status, but notes that the sources and robustness of these estimates is sometimes unclear. In the following table the F/Fmsy ratios provided in the Greek MP are compared with those available from latest stock assessments published by STECF EWG 20-15 (2020) and GFCM (2021). The values provided by GFCM for hake in GSA 20 and red mullet for GSA 20 do not seem to correspond with the MP values. STECF notes that in the MP it is reported that the other values have been calculated in the framework of the RECFISH project and included in the Greek Fishing Fleet annual report 2020 (Anonymous, 2020).

GSA	**Species**	**MP values**	**STECF (2020)**	**GFCM (2021)**
22	Hake (HKE)	1.10	NA	NA
22	Red mullet (MUT)	0.30	0.30	0.30
22	Striped red mullet (MUR)	0.66	-	-
22	Deep-water rose shrimp (DPS)	0.73	NA	-
22	Picarel (SPC)	0.18	-	-
20	Hake (HKE)	1.54	NA	1.83
20	Red mullet (MUT)	0.52	-	1.19
20	Striped red mullet (MUR)	0.46	-	-
20	Deep-water rose shrimp (DPS)	0.85	-	-
20	Picarel (SPC)	0.48	-	-

Incidentally, STECF notes that for hake in GSAs 20 and 22 the GFCM (2021) working group on stock assessment (on the basis of an a4a approach) recommended a reduction in fishing mortality. STECF EWG 20-15 concluded that it was not possible to provide an assessment or index advice for these stocks because catch data were uncertain with different sources in conflict and sparse survey information.

Notwithstanding, STECF notes that the results presented in the Greek MP show that hake in GSAs 20 and 22 are the most severely exploited stocks, which is consistent with the situation observed in other Mediterranean GSAs.

STECF also notes that GFCM (2021) assessed the stock status of red mullet in GSA 20 as in overexploitation and the scientific advice was to reduce fishing mortality, while the F/Fmsy value (0.52) reported in the MP indicates a different situation.

STECF advises that the stock assessments performed by Greece be presented and further discussed in GFCM for full endorsement.

Concerning the issue raised during PLEN 13-02 regarding the fact that also fishery dependent data from other countries (e.g., Turkey) should be considered in stock assessments, STECF acknowledges that in EWG 20-15 the Turkish (FAO/GFCM) catches were also included in the assessment and it was assumed that their catch length composition was similar to the one of the Greek fleets.

- *Description of the fishing pressure and measures to accomplish a sustainable exploitation of the main target stocks*

Data presented in the MP is related to the OTB fleet operating in Greece, consisting in 248 vessels corresponding to 1.7% of the total fishing fleet in Greece (i.e., 13,952 vessels, mostly belonging to the small-scale fishery). The OTB fleet includes two vessel length classes: 18-24m and 24-40m. STECF notes that the Greek fishing fleet has been reduced by 30% in the last twenty years, due to vessels withdrawal.

STECF notes that the Draft Ministerial decision limits at 255 vessels the maximum number of OTB fishing authorizations to be granted. This will prevent the number of vessels to increase substantially from its current level. The MP also includes provision for seasonal and spatial closures. In particular, OTB is prohibited from June to September, from 16 to 31 May and from 24 to 31 December each year in internal waters of Greece and inside the 6 nm buffer from the baseline of the coastline. Additionally, in GSAs 22 and 23 permanent FRAs cover 38% of the overall area, while 28% is covered by seasonal FRAs.

- *Data on catches (landings and discards) of the species concerned, fishing effort and abundance indices such as catch-per-unit-effort (or CPUE)*

A table reporting the landing biomass of Greek OTB was provided for the period 2000-2019. STECF notes that in this period, OTB landings decreased from 27,126 tons in 2007 to 14,606 tons in 2018. This reduction is consistent with the fleet size reduction. The MP states that landings include more than 100 species (Tserpes et al., 2016), but no list of species has been provided.

STECF notes that a table summarising the average landing biomass (period 2017-2019) of the main species targeted by the Greek OTB (hake, red mullet, striped red mullet, picarel, and deep-water rose shrimp) was provided in the MP.

STECF notes that these species made up 31% of the OTB landings in the period 2017-2019. STECF also notes that hake is the most important species (mean value of 1938 tons in 2017-2019; 13% of the total OTB landings), followed by red mullet (mean value of 1132 tons in 2017-2019; 8% of the total OTB landings).

STECF notes that the MP provides a table reporting the discard ratio estimates for hake, red mullet and deep-water rose shrimp in GSA 20 and GSAs 22 and 23 combined (Reference year 2018). Discard rates ranged from 1.0% (red mullet in GSAs 22-23) to 5.1% (deep-water rose shrimp in GSA 20).

STECF notes that discard rates for hake and deep-water rose shrimp in the Aegean Sea were generally higher in the previous Greek OTB MP assessed in PLEN 13.02. STECF notes further that these low discard ratios are not fully consistent with other values reported in the scientific literature for the same fleet (e.g. Damalas et al., 2018; Despoti et al., 2021), and the accuracy of these estimates would then need to be verified.

STECF notes that information on OTB fishing effort was provided on a monthly basis by means of maps showing its spatial distribution and with a graphic comparing the years 2016-2018. All OTB vessels are equipped with VMS systems and data analysis show that the higher nominal effort was recorded at the northern part of the Aegean Sea, reaching up to 45% of the total effort. Most of the fishing effort (75%) was recorded on the continental shelf (depths < 200m).
STECF notes that no abundance indices, such as CPUE, have been provided.

STECF notes that no information on catch-per-unit-effort has been provided.

- *if possible, catch composition in terms of size distribution*

No data on the catch composition in terms of size distribution has been provided.

- *Information on the social and economic impact of the measures proposed*

Based on scenarios simulations, STECF notes that the proposed MP will result in slightly increased catches and fishers' income (10-12%) on the medium term (projection 2020-2025). In addition, higher profit increases would be expected, as operational costs will somehow decrease, due to the shorter distance of fishing grounds.

- *Potential impact of the fishing gear on the marine environment with particular interest on protected habitats (i.e. seagrass bed, coralligenous habitat and maërl bed)*

STECF notes that in the MP it is reported that OTB fishery exploits sandy/muddy bottoms at depths greater than 50m and therefore shallow sea-grass habitats would not be affected. *Posidonia oceanica* has indeed been described to be found no deeper than 40-45 m (Telesca et al., 2015), which would support that the 50 m limit would not affect such phanerogam. Also, trawling over sensitive habitats such as *Posidonia* and maërl beds is not allowed through EU and national regulations.

However, in general, STECF notes that there is no information in the MP that allows STECF to assess the impact of the proposed measures on the marine environment. In particular, the requested derogation for OTB regarding the minimum distance from the coast (zone between 1 to 1.5 nm from the coast) would increase the fishing ground by a 0.5 nm strip where depth is greater than 50 m. Therefore, in case this derogation will be granted, the OTB fleet would exploit new fishing grounds located more inshore, where coralligenous and maërl beds could occur. STECF notes that no spatial information on the presence of these sensitive habitats has been provided in the MP. Also, as Annex III (see the Summary of the information provided to STECF chapter) was not provided, STECF cannot evaluate the magnitude and position of the additional fishing grounds.

1.2. Objectives, safeguards and conservation/technical measures

- *Objectives that are consistent with the objectives set out in Article 2 and with the relevant provisions of Articles 6 of CFP Regulation and quantifiable targets, such as fishing mortality rates and total biomass*

The overall objective of the MP is to ensure that demersal stocks will be exploited within safe biological limits, in accordance with the CFP principles. The MP states that is aims to increase SSB levels by reducing fishing effort and by changing the distribution of F over different demographic components of the exploited stocks.However, STECF notes that no indication is provided on how effort would be reduced in case F/Fmsy would be >1, as the MP considers 1 as the maximum allowed exploitation rate.
STECF notes that in addition to the F/Fmsy ratio, the MP will consider B/Bmsy = 1 or SSB/SSBmsy = 1 as the minimum accepted stock biomass level.

- *Objectives for conservation and technical measures to be taken in order to achieve the targets set out in Article 15 of Regulation (EU) No 1380/2013, and measures designed to avoid and reduce, as far as possible, unwanted catches*

Only limited information on some bycatch has been included in the MP (see point 1.1. above) and no details are provided on potential measures to avoid and reduce unwanted catches.

- *Measures proportionate to the objectives, the targets and the expected time frame*

The MP indicates that in case that the annual stock assessments would show overfishing (i.e., F/Fmsy >1), additional management measures will be taken, independently from the values of the biomass ratio. Those measures will include complementary temporal fishery closures aiming to bring exploitation rates at optimum levels.

STECF notes, however, that no additional information was provided, in particular the MP does not include any quantitative aspect related to the time frame, harvest control rules to reduce fishing effort, or potential spatio-temporal closures.

- *Safeguards to ensure that quantifiable targets are met, as well as remedial actions, where needed, including situations where the deteriorating quality of data or non-availability places the sustainability of the main stocks of the fishery at risk*

STECF notes that the MP does not specify which emergency measure will be adopted in case the quantifiable targets would not be met.

STECF notes that the MP only reports that those measures will include complementary temporal fishery closures aiming to bring exploitation rates at optimum levels.

- *Other conservation measures, in particular measures to gradually eliminate discards, taking into account the best available scientific advice or to minimise the negative impact of fishing on the ecosystem*

STECF notes that no additional conservation measure to the ones already listed above (see chapters: "Description of the fishing pressure and measures to accomplish a sustainable exploitation of the main target stocks" and "Potential impact of the fishing gear on the marine environment with particular interest on protected habitats") are provided.

1.3. Other aspects:

- *Quantifiable indicators for periodic monitoring and assessment of progress in achieving the objectives of the plan*

In the MP it is reported that fishing activities are closely monitored through the Greek Fisheries Data Collection Program established in accordance with the 2016/1251 EU Commission Decision. Monitoring includes concurrent on-shore and at-sea sampling carried out on quarterly basis. On-shore sampling provides information on the species and size composition of the landings while at-sea sampling mainly aims to identify the size composition of the catch for all commercial and discarded species. In addition, spatiotemporal abundance fluctuations for all demersal species, are followed through the MEDITS bottom-trawl survey that is accomplished on an annual basis. All monitoring activities, including the MEDITS survey, cover all areas exploited by the Greek fleets, i.e. Aegean, Cretan (GSAs 22 and 23) and Ionian seas (GSA 20).

TOR 2. Evaluate whether the following conditions set by the MedReg are fulfilled:

2.1 Derogation to the distance from the coast (Article 13 – Paragraphs 2 and 11)

- *The sea-depth shall not be less than the 50 metres isobaths*

The MP states that OTB fishing activity will be allowed only at depths greater that 50 m.

- *There are particular geographical constraints, such as the limited size of coastal platforms along the entire coastline of the Member State or the limited extension of trawlable fishing grounds*

STECF notes that the MP only mentions that Greece has a narrow continental shelf, but no spatial data showing particular geographical constraints are provided.

- *The fisheries have any significant impact on the marine environment*

STECF notes that no information is provided to understand the potential impact of OTB activity in the marine environment of the fishing area requested for derogation (i.e., from 1.0 nm to 1.5 nm from the coast).

- *The fishing activities fulfil the requirements of Article 4 of the Mediterranean Regulation*

STECF notes that the MP does not allow OTB fishing at depths shallower than 50 m, therefore the MP assumes that shallow sea-grass habitats would not be affected.

STECF notes however that although some evidence in the literature exist that *Posidonia oceanica* lives at depths lower than 40-45 m (Telesca et al., 2015), no specific spatial information on the presence of coralligenous and maërl beds in the fishing area requested for derogation (i.e., from 1.0 nm to 1.5 nm from the coast) has been provided in the MP.

- *The fisheries and do not contain any increase in the fishing effort with respect to what is already authorized by Member States*

STECF notes that the Draft Ministerial decision for enforcing the MP foresees a maximum number of fishing vessels (255) which is close to the current number of vessels, and an additional week of fishing ban in May every year.

- *The fisheries are subject to a management plan and carry out a monitoring of catches as requested in Article 23*

STECF notes that Greece has provided sufficient information to fulfil this condition. The OTB fishery in Greek sea is regulated by MP, which was adopted for the first time in 2014. All Greek bottom trawlers use the electronic recording and reporting system (ERS) in order to record and report fisheries data, including the species composition of their landings. Nevertheless, STECF underlines that the monitoring of catches should cover all components, i.e. also discards and unwanted catches of all species.

- *The fisheries do not interfere with the activities of vessels using gears other than trawls, seines or similar towed nets*

STECF notes that no mention is made in the MP on potential spatial conflicts of OTB with passive gears, but considers that such interference may occur if trawls operate closer to the shore.

2.2 Evaluate any additional information and documents provided to support the Greek request to update its management plan.

In the MP a number of basic economic variables per OTB fleet segment (18-24 m and 24-40 m) have been provided for reference year 2017. STECF notes that energy costs was the main expenditure item (about 30% of the total expenditures), followed by personnel and other variable costs.

STECF conclusions

STECF acknowledges the effort made by the Greek Administration in providing information required for the MP, in particular regarding stock status and reference points. STECF advises though that the stock assessments performed by Greece be presented and further discussed in GFCM for full endorsement.

STECF concludes, however, that the MP does not prescribe any explicit harvest control rules nor safeguards and quantified measures to ensure future sustainable exploitation rates, in particular for hake, which is already overexploited in both GSAs.

STECF is not able to fully assess the potential impact of the proposed derogation on the marine environment and resources which are present inside the 1-1.5 nm strip, as well as interference with other fisheries. STECF notes that past studies performed before the enforcement of the Med Reg demonstrated that 34% of the OTB fishing effort took place in the 1-1.5 nm zone (Tserpes et al. 2008; 2011). Therefore, if one third of the fishing effort would redistribute inside the 1-1.5 nm strip, STECF considers that a deeper analysis of the potential impact of OTB on sensitive habitats (in particular coralligenous and maerl beds), coastal nursery and spawning aggregations would be required.

STECF advises that the impact of effort displacement towards the coastal zones be evaluated following similar modelling procedures as when evaluating the impact of closed areas, as regularly performed in other GSAs and sea basins and for which STECF has provided technical guidelines (STECF PLEN 19-03 and STECF 20-01, see also ToR 6.4 of this Plenary report).

In this view, STECF suggests that any information available on species abundance and distribution in the 1-1.5 nm zone be collated from both scientific survey and commercial data, and that knowledge gaps are identified and addressed where needed through a dedicated scientific protocol in order to compare the 1-1.5 nm strip with the traditional fishing ground of OTB.

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6.3 Review of national management plans for shore seines in certain territorial waters of France (PACA and Occitanie)

Background provided by the Commission

In accordance with Article 13(1) of Regulation (EC) No 1967/20065 (henceforth the Med Reg), the use of towed gears is prohibited within 3 nautical miles of the coast or within the 50 m isobath where that depth is reached at a shorter distance from the coast. At a request of a Member State, derogation from Article 13(1) may be granted, provided that the conditions set in Article 13(5) and (9) are fulfilled.

A general condition for all derogations is that the fishing activities concerned are regulated by a management plan in accordance with Article 19 of the Med Reg. 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 consider:

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.

In 2013, the Common Fisheries Policy (CFP) introduced new elements for conservation such as the target of maximum sustainable yield (MSY) for all the stocks by 2020 at the latest, the landing obligation and the regionalisation approach.

In line with these two regulations, the plans shall be based on scientific, technical and economic advice, and shall contain conservation measures to restore and maintain fish stocks above levels capable of producing MSY. Where targets relating to the MSY (e.g. fishing mortality) cannot be determined, owing to insufficient data, the plans shall provide for measures based on the precautionary approach, ensuring at least a comparable degree of conservation of the relevant stocks.

The plans may contain specific conservation objectives and measures based on the ecosystem approach to achieve the objectives set. In particular, it may incorporate any measure included in the following list to limit fishing mortality and the environmental impact of fishing activities: limiting catches, fixing the number and type of fishing vessels authorized to fish, limiting fishing effort, adopting technical measures (structure of fishing gears, fishing practices, areas/period of fishing restriction, minimum size, reduction of impact of fishing activities on marine ecosystems and non-target species), establishing incentives to promote more selective fishing, conduct pilot projects on alternative types of fishing management techniques.

5 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32006R1967R%2801%29

In March 2021, the French Administration has expressed its intention to adopt a new management plan for shore seine fishing in certain territorial waters of France (PACA and Occitanie). This plan envisions the renewal of the derogation from EC 1967/2006 article 13 in terms of distance and minimum depth from the coast in waters of France (PACA and Occitanie), which is currently granted with the Regulation (EU) 2018/1596 of 28 October 2018. The current derogation has expired on 25 August 2021.

Supporting documents

The original documents (in French) were provided which were machine-translated in English versions:

1. France's report to the European Commission - on the follow-up of the derogation concerning beach seine fishing in the Mediterranean
2. Additional information to the Report from France to the European Commission on the follow-up of the derogation concerning beach seine fishing in the Mediterranean of 23 June 2021

Background documents are published on the meeting's web site on: https://stecf.jrc.ec.europa.eu/plen2103

Request to the STECF

The STECF is requested to review and make any appropriate comments and recommendations on the new management plan for the shore seine fishery and its supporting study.

In particular, STECF is requested to:

TOR 1. Advise and assess whether the management plan for shore seines in the waters of Occitanie and PACA contains adequate elements in terms of:

1.1. The description of the fishery

- Biological characteristics and state of the exploited resources with reference in particular to long-term yields.
- Description of the fishing pressure and measures to accomplish a sustainable exploitation of the main target stocks.
- Data on catches (landings and discards) of the species concerned, fishing effort and abundance indices such as catch-per-unit-effort (or CPUE).
- if possible, catch composition in terms of size distribution.
- Information on the social and economic impact of the measures proposed.
- Potential impact of the fishing gear on the marine environment with particular interest on protected habitats (i.e. seagrass bed, coralligenous habitat and maërl bed);

1.2. Objectives, safeguards and conservation/technical measures

- Objectives that are consistent with the objectives set out in Article 2 and with the relevant provisions of Articles 6 of CFP Regulation and quantifiable targets, such as fishing mortality rates and total biomass.
- Objectives for conservation and technical measures to be taken in order to achieve the targets set out in Article 15 of Regulation (EU) No 1380/2013, and measures designed to avoid and reduce, as far as possible, unwanted catches.
- Measures proportionate to the objectives, the targets and the expected time frame.
- Safeguards to ensure that quantifiable targets are met, as well as remedial actions, where needed, including situations where the deteriorating quality of data or non-availability places the sustainability of the main stocks of the fishery at risk.
- Other conservation measures, in particular measures to gradually eliminate discards, taking into account the best available scientific advice or to minimise the negative impact of fishing on the ecosystem.

1.3. Other aspects:

- Quantifiable indicators for periodic monitoring and assessment of progress in achieving the objectives of the plan.

TOR 2. Evaluate whether the following conditions set by the MEDREG and Regulation (EU) 2019/1241 are fulfilled:

2. Derogation to the distance from the coast (Article 13 – Paragraphs 5 and 9)

- There are particular geographical constraints, such as the limited size of the continental shelf along the entire coastline;
- The fishery has no significant impact on the marine environment;
- The fishery involves a limited number of vessels and does not contain any increase in the fishing effort with respect to what is already authorized by Member States;
- The fishery cannot be undertaken with another gear;
- The fishery is subject to a management plan and carry out a monitoring of catches as requested in Article 23;
- The vessels concerned have a track record of more than 5 years;
- The fishery does not interfere with the activities of vessels using gears other than trawls, seines or similar towed nets;
- The fishery is regulated in order to ensure that catches of species mentioned in Annex IX of Regulation (EU) 2019/1241 with the exception of mollusc bivalves, are minimal
- The fishery does not target cephalopods.

2.2 Derogation to the minimum mesh size (Article 9, paragraph 7), if requested by the management plan

- The fisheries are highly selective and have a negligible effect on the marine environment; and
- The fisheries do not operate above seagreass beds of, in particular, *Posidonia oceanica* or other marine phanerogams

Summary of previous evaluation of the derogations for shore seines operating in certain territorial waters of France (STECF PLEN 18-02 and PLEN 21-02)

On 23 May 2018 France submitted a request to prolong the derogation from the first subparagraph of Article 13(1) for 3 more years. The request was supported by 14 documents in French (all provided to the STECF).
STECF PLEN 18-02 was unable to conclude whether the conservation and management measures foreseen and implemented in the management plan of shore seines in the French Mediterranean meet the conservation and management requirements and objectives set out in the MedReg and in the CFP.

STECF PLEN 18-02 concluded that:
- *the impact* of French beach seines operating in the Mediterranean on the concerned stocks and habitats (particularly Posidonia meadows) may be limited, but cannot conclude that it is negligible.
- management objectives should be identified not only for sardine but also for horse mackerel, anchovy, sand smelt, which are target species of the French beach seines too. The management plan should clearly separate the two métiers (poutine and non-poutine seine)
- not all conditions set up in Articles 13(5) and 13(9) of the MedReg to grant derogation are fulfilled. Specifically, the requirement of Article 9(3)(2) was not met because of the minimum mesh sizes authorized (14 mm for non-poutine and 2 for poutine seine) and because of the fact that catches of species mentioned in Annex III (particularly sardine, horse mackerel and anchovy) made by poutine seines were not minimal. Furthermore, STECF was not able to evaluate the fulfilment of some conditions such as the impact on the marine environment, and more precisely on the Posidonia meadows.

STECF PLEN 18-02 noted that the management plan submitted by the French Administration included a derogation request regarding minimum distance from the shore and depth, but not regarding the minimum mesh size.

STECF PLEN 18-02 acknowledged that these beach fisheries are artisanal, small-scale fisheries (SSF) that are part of the local social and ecological system, interwoven with economic, social, and cultural life in local communities in French regions where they operate. However, STECF could not assess the potential economic impact of granting or not granting the requested derogations.

STECF PLEN 21-02
On 23 June 2021, France submitted a request to renew the derogation concerning beach seine fishing in the Mediterranean Sea, providing a Report justifying the derogation and a Decree defining the control and monitoring plan for beach seine vessels.
Although the request was forwarded to STECF PLEN 21-02 for evaluation, the French authorities finally decided to retract it with the intention to resubmit a revised version later on in 2021.

Summary of the information provided to STECF

Two documents were provided to STECF, which are summarized below.

Doc 1. France's report to the European Commission - on the follow-up of the derogation concerning beach seine fishing in the Mediterranean

The report provides a summary description of the French beach seine fishery, and then revolves around three main management measures for the activity which are contained in the current regulatory framework. These three measures are:

- the quota for European fishing authorizations (EAF) with a view to reducing the fleet;

- the implementation of a national plan to control and monitor landings;

- the scientific monitoring of the activity as well as its impact on the marine environment.

Doc 2. Additional information to the Report from France to the European Commission on the follow-up of the derogation concerning beach seine fishing in the Mediterranean of of 23 June 2021

The document delivers some detailed information not included in the Report. More specifically it provides:

- monthly effort and total catch data for the period 2018-2020 and a visual representation of the catch composition in a form of a pie-chart for 2018
- a justification by the French authorities on why the fishery is not a priority in their data collection scheme.

STECF comments

STECF PLEN 21-03 is requested to review and make any appropriate comments and recommendations on the new management plan for the shore seine fisheries and its supporting study.

STECF PLEN 21-03 focused on identifying any new elements in the new management plan submitted; the core management plan under which the fishery is operating has been in place since 20146.

Furthermore the 'Report' (Doc 1) is largely a review of the national control & monitoring plan put in place since 20187.

The contents of the documents provided (Doc 1.Report & Doc 2.Additional information) are summarized below:

Description of fisheries

- The fishery comprises of two métiers:

  - 'poutine' targeting sardine juveniles (2 mm mesh) – 9 vessels operating in 2019

  - 'classic' or 'non-poutine' targeting adult fish including sardine (14 mm mesh) – 8 vessels operating in 2019
- The fishery operates under derogation granted by Regulation 2018/1596 of 23 October 2018
- The combined annual catches of the two métiers for the 8 species most landed was just over 11 tons in 2018 (Doc 1). However, these values are revised in the additional information document (Doc 2) being around 8 tons in 2018, 6 tons in 2019 and 2.2 tons in 2020.

6 Arrêté du 8 septembre 2014 créant des régimes d'autorisations européennes de pêche pour certains engins ou techniques de pêche maritime professionnelle utilisés en mer Méditerranée par les navires battant pavillon français (https://www.legifrance.gouv.fr/loda/article_lc/LEGIARTI000029441910/)

7 Arrêté du 7 août 2018 définissant un plan de contrôle et de suivi des débarquements pour les navires titulaires d'une autorisation Européenne de pêche à la senne de plage (https://www.legifrance.gouv.fr/jorf/article_jo/JORFARTI000037308151)

- The gears are light (hauled by hand, no otter boards) and operated over soft, relatively flat bottoms without rocks or other obstacles

Issues related to the set 'Fleet quota' in the management plan:

- a significant decrease of fishing vessels from 37 (2014) down to 17 (2020) is reported
- fishing effort is still set to 1386 days for all vessels combined, regardless of number of vessels involved in the fishery
- only 17% of this effort has been utilized in 2018, 14% in 2019 and 10% in 2020.

Control & surveillance outcomes

The outcomes of the recent national control & monitoring plan put in place since 20188 are provided in the report:

- Verification of compliance with the fishing effort regime
- Physical verification of compliance of fishing gear
- Monitoring of reporting obligations
- Physical inspections at landing locations
    - 2 inspections/year/vessel required → target not reached
    - 0% violation rate (0 out of 28 inspections)
- Prior notification obligations (pilot – to be improved in 2020-2021)
    - 66% in PACA region
    - 6% in Pyrenees-Orientale region

Scientific monitoring on activity

The only quantifiable information provided is the catch composition (in weight) for the whole fleet during 2018 (page 17 in Doc 1 - see also Table 1 below). The 'Additional information' (Doc 2) provides monthly effort and total catch data for the period 2018-2020 and a visual representation of the 2018 catch composition in a form of a pie-chart.

Additionally, a list of statements on the sustainability of the fishery, in a form of bullet points, is also given:

- "*In 2013, an evaluation carried out by the STECF showed that the beach seine fishing activity… …has a negligible impact on the marine environment.*"
- "*This fishery is not carried out above protected habitats*"
- "*The logbooks mention the catches when they exceed the thresholds provided*"
- "*Catches of species listed in Article III as well as cephalopods are minimal*"

8 Arrêté du 7 août 2018 définissant un plan de contrôle et de suivi des débarquements pour les navires titulaires d'une autorisation Européenne de pêche à la senne de plage (https://www.legifrance.gouv.fr/jorf/article_jo/JORFARTI000037308151)

ToRs accompanying the request to the STECF, are addressed one by one in the following table:

ToR 1. STECF is requested to advise and assess whether the management plan for shore seines in the waters of Occitanie and PACA contains adequate elements in terms of:	
	STECF comments
1.1. The description of the fisheries	
the biological characteristics and state of the exploited resources with reference to long-term yields	*Monthly **total catch** data for the period 2018-2020 is provided in Doc 2; no information on state of resources or biological characteristics.* *STECF notes though that according to the most recent assessments (GFCM -WGSASP 20219) sardine is sustainably exploited in GSA7 and 9 and overexploited in GSA6.*
the description of the fishing pressure and measures to accomplish a sustainable exploitation of the main target stocks	*Monthly **total effort** data for the period 2018-2020 are provided in Doc 2; The effort quota of 1386 days/year has not been exhausted (less than 20% has been utilized – page 12 in Doc 1, pages 2-4 in Doc 2)*
data on catches (landings and discards) of the species concerned, fishing effort and abundance indices such as catch-per-unit-effort (or CPUE)	*At a species level, total fleet catches for 8 taxa is provided (page 17 in Doc 1 – Reported in Table 6.3.1); STECF notes that this list **lacks sand smelt (Atherina spp.) which though accounted for 70% of the catch in this fishery** (see STECF PLEN 18-02 and background documents therein), **as well as salema (Sarpa salpa) which is a species to be assessed based on a CPUE threshold** as set in the French management plan. STECF raises question on why catch data on the target species of the fishery are not reported.* *Information on CPUEs would be expected to be available since they should be used in management; a statement in the Report (page 16 in Doc 1) underlines that: "the logbooks mention the catches when they exceed the thresholds provided for in Article 23 of Regulation 1967/2006".* No such info was though provided to the STECF.
catch composition in terms of size distribution	*No information provided*

9 https://www.fao.org/gfcm/technical-meetings/detail/en/c/1412409/

information on the social and economic impact of the measures proposed	*No information is provided.*
potential impact of the fishing gear on the marine environment with particular interest on protected habitats (i.e. seagrass bed, coralligenous habitat and maërl bed)	*There is a reference to the experimental geolocation program RECOPESCA; French authorities claim that data obtained from a sample of vessels showed that the beach seine fishing activity is not practiced above habitats protected by Article 4 of Regulation (EC) No 1967/2006.* *However, no specific outcomes of this program have been made available to STECF (e.g.: fishing footprint maps overlayed over sensitive habitats), nor could be accessed through online search, so STECF cannot assess the validity of the statement.*

Table 6.3.1. Catch composition of species landed (in weight) by all French beach seine vessels during 2018. From Doc. 1 p. 17

Species	Catches 2018 (kg)	Contribution	Included in Annex IX of Regulation (EU) 2019/1241
Rogue (*B. boops*)	528	4.60%	no
Squids	253	2.20%	no
Black horse mackerel (*T. trachurus*)	2667	23.30%	yes
Gilthead bream (*S. aurata*)	254	2.20%	yes
Striped seabream (*L. mormyrus*)	446	3.90%	yes
Common Pandora (*P. erythrinus*)	3745	32.80%	yes
Red mullet & striped red mullet (*Mullus spp.*)	1905	16.70%	yes
Sardine (*S. pilchardus*)	1635	14.30%	yes
Grand total	**11433**		

STECF comments

1.2. Objectives, safeguards and conservation/technical measures	
Objectives that are consistent with the objectives set out in Article 2 and with the relevant provisions of Articles 6 of CFP Regulation and quantifiable targets, such as fishing mortality rates and total biomass.	*Reiterating the previous evaluation from STECF PLEN 18-02, and once again given the lack of appropriate data, STECF PLEN 21-03 is unable to assess whether the conservation and management measures in the management plan meet the requirements and objectives set out in MedReg & CFP.*
Objectives for conservation and technical measures to be taken in order to achieve the targets set out in Article 15 of Regulation (EU) No 1380/2013, and measures designed to avoid and reduce, as far as possible, unwanted catches	*Furthermore, no new information has been put forward to assess the impact of shore seines on vulnerable aquatic habitats, such as nursery*

Measures proportionate to the objectives, the targets and the expected time frame.	*and breeding grounds, and negative impacts on fish stocks through the catching of juveniles10.*
Safeguards to ensure that quantifiable targets are met, as well as remedial actions, where needed, including situations where the deteriorating quality of data or non-availability places the sustainability of the main stocks of the fishery at risk	*STECF acknowledges though that fishing effort and catches gradually decrease together with the diminishing number of boats, and this would correspond to a reduction of the impact of the fishery on the ecosystem and the resources.*
Other conservation measures, in particular measures to gradually eliminate discards, taking into account the best available scientific advice or to minimise the negative impact of fishing on the ecosystem	*STECF considers that the fishing effort ceiling stated in the plan should accordingly be revised downwards.*
1.3. Other aspects:	
Quantifiable indicators for periodic monitoring and assessment of progress in achieving the objectives of the plan.	*Such indicators have been set in the French management plan11 including a CPUE threshold of 14.73 kg/trip for salema (Sarpa salpa) and an exploitation rate of E < 0.4 for sardine stocks in GFCM GSAs 6-7 & 9.* *However, no data supporting the monitoring of the CPUE indicators has been provided to the STECF.*
TOR 2. Evaluate whether the following conditions set by the MEDREG and Regulation (EU) 2019/1241 are fulfilled	
2.1 Derogation to the distance from the coast (Article 13 – Paragraphs 5, 9 and 10)	
There are particular geographical constraints, such as the limited size of the continental shelf along the entire coastline;	*No such info is provided in the documents submitted. However, STECF PLEN 18-02 considered that geographical constraints such as the limited size of coastal shelf may exist in some areas around Nice, but this is not evident in the areas further south, along the southern coast of former Languedoc-Roussillon region*

10 FAO 2011 Fishing with Beach Seines. FAO Fisheries and Aquaculture Technical Paper 562

11 Arrêté du 8 septembre 2014 créant des régimes d'autorisations européennes de pêche pour certains engins ou techniques de pêche maritime professionnelle utilisés en mer Méditerranée par les navires battant pavillon français (https://www.legifrance.gouv.fr/loda/article_lc/LEGIARTI000029441910/)

	(now re-called Occitanie) where the continental shelf is wider.
The fisheries have any significant impact on the marine environment;	*STECF notes that given the lack of relevant data on:* *- mortality rates/biomass for the target species,* *- magnitude of discards* *- size composition of catches* *- fishing footprint* *the impact on the environment cannot be assessed.* *Nevertheless, STECF acknowledges that fishing effort and catches gradually decrease together with the diminishing number of boats, and this implies a corresponding reduction of the impact of the fishery on the ecosystem and the resources*
The fisheries involve a limited number of vessels and do not contain any increase in the fishing effort;	*Based on the French report (Doc 1), STECF notes that the number of vessels has been reduced from 37 in 2014 down to 17 in 2020; effort has also decreased significantly and only 10% of the quota (expressed in fishing days) has been utilized in 2020.*
The fisheries cannot be undertaken with another gear;	*STECF cannot assess whether this is the case; evidence must be provided that this fishery cannot be performed with different gears (e.g. gears that do not require any derogation)*
The fisheries are subject to a management plan and carry out a monitoring of catches as requested in Article 23;	*No systematic monitoring of catches is conducted. The French authorities justify this in Doc 2, arguing that the fishery is of low priority in the French data collection scheme*
The vessels concerned have a track record of more than 5 years;	*No historical track record of more than 5 years is provided to confirm this, but considering the characteristics of the fishery it appears safe to assume that the fishery is only operated by vessels having a history in it.*
The fisheries do not interfere with the activities of vessels using gears other than trawls, seines or similar towed nets;	*STECF notes that the fishery operates in a very narrow buffer zone around the coastline and is very likely that there is no interaction with other fisheries; however, no info (e.g. fishing footprint by metier/gear) has been provided.*
The fisheries are regulated in order to ensure that catches of species mentioned in Annex IX of Regulation	*STECF observes that most landings reported in 2018 (Table 6.3.1) are species listed in Annex IX of Regulation (EU) 2019/1241 (6 of the 8*

(EU) 2019/1241 with the exception of mollusc bivalves, are minimal;	*reported species). No information is provided on what share of these catches is below the set MCRS, to assess if its minimal.*
The fisheries do not target cephalopods.	*STECF observes that cephalopods account for around 2% of the catches, so the fishery does not target cephalopods.*
2.2 Derogation to the minimum mesh size (Article 9, paragraph 7)	
The fisheries are highly selective and have a negligible effect on the marine environment	*STECF notes that no data on the level of discards or size composition of catches is provided to assess if the fishery can be considered as selective or not. Moreover, due to the small mesh sizes used, there is a very low escape probability for individuals of any species.*
The fisheries do not operate above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams.	*STECF observes that a specific reference is made to the experimental geolocation program RECOPESCA; French authorities claim (page 4 of Doc 1) that data obtained from a sample of vessels showed that the beach seine fishing activity is not practiced above habitats protected by Article 4 of Regulation (EC) No 1967/2006.* *However, no specific outcomes of this endeavor have been made available to STECF (e.g. fishing footprint maps overlayed over sensitive habitats).*

Overview of STECF observations

STECF mainly highlights the inconsistency regarding the level of catches provided during the recent French Report (Doc 1) and the values provided three years earlier to the STECF PLEN 18-02. The most recent catch composition of catches lacks sand smelt (*Atherina* spp.) which has been accounting for 70% of the catch in this fishery (see STECF PLEN 18-02 and background documents therein). The same stands for salema (*Sarpa salpa*) which has a quantifiable indicator in the management plan (CPUE threshold) for assessing its status, but is not reported in the 2018 catch composition.

Furthermore, STECF stresses that species included in the Annex IX of Regulation (EU) 2019/1241 comprise 93% of the reported catch in 2018, and this proportion cannot be considered minimal.

STECF conclusions

STECF acknowledges the implementation and outcomes of the national control and monitoring plan by French Administration since 2018.

STECF recognizes the gradual decrease of both fleet capacity and fishing effort ("bouilleur de cru" regime) for the French beach seines under study, indicating that the management plan is effectively working towards its objective of phasing out the fishery over time.

STECF concludes though that the effort ceiling set in the plan should be revised downwards in line with the actual decrease in fishing effort to prevent possible increase in the future.

STECF concludes that several elements requested in the ToRs could not be evaluated by lack of appropriate information provided. More specifically, the following are missing:

- Evolution of catches for all species captured (landings + discards) over time
- CPUEs for target species
- Size composition of catches
- Magnitude of discards
- Fishing footprint to evaluate if fishing activity is practiced above sensitive habitats
- Information on the social and economic impact of the measures proposed

STECF highlights in particular the absence of target species (sand smelt) in the most recent catch composition provided.

6.4 Follow-up of EWG 21-01: West Med assessments: evaluation of closure areas

Background provided by the Commission

In adopting the western Mediterranean multi-annual management plan, Member States agreed to Article 11.1, alternatively Article 11.2 that aims at protecting juveniles of hake. All three concerned Member States also adopted Article 11.3 and agreed to establish other closure areas by 17 July 2021 and on the basis of the best available scientific advice, where there is evidence of a high concentration of juvenile fish, below the minimum conservation reference size, and of spawning grounds of demersal stocks, in particular for the stocks concerned.

STECF PLEN 20-01 and STECF EWG 21-01 have reviewed the proposals of closures (placement and period) submitted by Italy and determine their efficiency to protect juveniles of hake, as planned in Article 11.2. However, in view of Article 11.3, this review should be expanded to juveniles and spawners of all demersal species covered by the West Med MAP and account for fishing effort displacement.

Request to the STECF

In light of additional data provided by IT in time for the Plenary, STECF is requested to review the proposals of closures (placement and period) submitted by Italy in 2020 and in 2021 and determine their efficiency to protect both juveniles and spawners of all demersal species covered by the West Med MAP and accounting for fishing effort displacement. To provide an order of magnitude of the closure efficiency, the proposed closure areas should aim at reducing about 20% of the bycatch of each target species in each GSA. Following the roadmap provided in the July STECF Plenary and based on available literature the Plenary could suggest complementary closed area for Italy in order to protect all demersal species covered by the MAP.

Summary of the information provided to STECF

Background documents are published on the meeting's web site on: https://stecf.jrc.ec.europa.eu/plen2103

Background documents provided to the STECF were:

- A pdf document entitled "Occurrence of spawning areas of species targeted in the Italian FRAs_rel.._.pdf"

A set of Italian scientists drafted this document to compile the "available information on the occurrence of spawning and nursery areas of species targeted by the EU Regulation 2019/1022 in the Fishing Restricted Areas (FRA) adopted by Italy to reduce of at least 20% of catches of European hake juveniles".

This document recalls that, by Italian Ministry Decrees, 10 Fishing Restricted Areas (FRAs) have been implemented from August 2020 onwards: three FRAs in GSA 9, five FRAs in GSA 10, and two FRAs in GSA 11. In the document, the occurrences of the main target species covered in EU Regulation 2019/1022 Art 1.1, including shrimps, hake, *Nephrops*, and red mullets, are described in each FRA and per GSA, but without supporting maps and in qualitative terms only. Hence, it is stated in the document that (Table 6.4.1):

Table 6.4.1. Stock overlap information with the 10 FRAs across GSA, deduced from the supporting document. Table made by the STECF. No corresponding map to region names were provided.

GSA	**Species**	**Spatial overlap between the FRA and juveniles and/or spawners**
GSA9	MUT	"it is adequate to infer that spawners of red mullet are present in the current FRAs in GSA 9"
	DPS	"there is an overlap between the current FRAs (especially at the greatest depths) and the presence of DPS spawners"
	HKE	"there is little overlap between the current FRAs and the areas with the highest concentration of hake spawners"
	NEP	"there is no overlap between the current FRA areas and the concentration areas of the species"
GSA10	MUT	"The available information indicates that the FRA of the Gulf of Castellammare constitutes both spawning and nursery areas of MUT"
	DPS	"main overlapping of the existing FRAs and nurseries occurred in the Gulf of Castellammare, Patti and Gaeta"
	HKE	"In any case there is no overlap between the existing FRAs"
	ARS, ARA and NEP	"no overlap between the existing FRAs and the spawning areas of these deep living crustaceans"
GSA11	HKE	"slight overlap of the nursery and spawning areas of the hake"
	DPS	" A slight overlap between nurseries (between 100-300m, mainly between 100-200 meters) and spawners (between 200-500m) in the Buggerru FRA"
	MUT, MUR, ARS and NEP	"No spawning and nursery areas were identified in the two Sardinian FRAs"

- The scientific articles quoted in the main document, include references to:
    - Abella et al 1996 (published in Italian)
    - Colloca et al. 2014 (on Deep sea shrimp in GSA9, 1995-2010 survey data, using a GAM modelling for describing the spatial distribution)
    - Fiorentino et al. 2008 (on red mullet in Gulf of Castellammare, 1985-2005 survey data, not a spatial study)
    - Ligas et al 2015 (on juvenile Hake, Ligurian Sea and the Tyrrhenian Sea, 2011 trawl survey data, using a GAM modelling)
    - Voliani et al 1998 (on red mullet, around Elba Island, 1985-1995, spatial implicit study using a multivariate analysis)
    - MEDISEH report (below)

- The MEDISEH ("Mediterranean Sensitive Habitats") final report published in April 2013.

The report of this large project mentioned that "*available past and recent survey data suitable for modeling and the identification of nursery and spawning areas have been retrieved and used in the report. In addition, considerable effort was put to standardise the analysis of available data and the modeling approach. Scripts in R statistical interface were specifically developed for this purpose. One issue raised in particular was the identification of suitable density thresholds to identify the high concentrations of juveniles and spawners.*"

In particular, for the demersal species covered by the Regulation 2019/1022, the MEDISEH report states that: "*For the demersal target species (i.e. Aristaeomorpha foliacea, Aristeus antennatus, Merluccius merluccius, Mullus barbatus, Mullus surmuletus, Nephrops norvegicus, Parapenaeus longirostris, Pagellus erythrinus, Galeus melastomus, Raja clavata, Illex coindetti, Eledone cirrosa) MEDITS bottom trawl survey data /species/ life stage were used to identify length at first maturity (depending on the species spawning period) and obtain No/km2 per recruits/spawners. Spatial analysis techniques were applied per species/GSA/life stage and different modeling approaches were applied per GSA depending on data peculiarities e.g. GAMs, GAMMs, CoziGams, ZiGams, geostatistics in order to obtain annual density/ probability maps. Density hot spot areas were identified per GSA and subsequently persistent maps based on the probability of each point being a hot spot."*

The MEDISEH report also identify some shortcomings that could impair the assessment when identifying the best candidates for closed areas/restricted areas to fishing: "*Difficulties encountered involved mainly the problem that MEDITS bottom trawl survey is not designed to cover the distribution of all target species: especially the nurseries can be very coastal and thus not well covered by the survey; MEDITS takes place during the summer period only, thus there is an issue matching between spawning season and survey period; often available data were not adequate or consistent within the sampling period to apply models and bottom type, a variable that is very well associated to demersal species, is available at a very coarse spatial resolution for the Mediterranean*."

- To complement the present assessment, STECF PLEN 21-03 also used previous STECF reports:
    - STECF-PLEN-21-02 ToR 6-2 "Follow up of EWG- 21-01"

In its assessment, the STECF concluded that the evaluation of alternative closure scenarios should follow the technical guidelines provided by STECF PLEN 19-03 and STECF 20-01. At the time of PLEN 21-02, no documentation was received from Italy.

- STECF EWG 21-01 "West Med assessments: conversion factors, closures, effort data and recreational fisheries"

EWG 21-01 concluded that, regarding the proposals for additional closures that the Member States should submit, none of the suggestions received reached the objectives required when they were considered exclusively (i.e. when not combined with additional measures) for any of the fractions of the species analysed.

- STECF EWG 21-13 "Fishing effort regime for demersal fisheries in West Med (Part VI)"

EWG 21-13 conducted extended simulation work regarding management scenarios in GSAs 8-9-10-11 (e.g. reduction of fishing capacity, reduction of fishing effort, spatial closures, TACs or increased selectivity). Spatially-explicit SMART simulations in this EWG included activating the restriction of fishing activities by the FRA network currently

required by the regulation in Italy. In the SMART modelling approach, the effort displacement induced by the scenario for closures is accounted for with each fishing vessel following a profit maximization strategy. However, the effect of closing the FRAs was not tested without the effort reduction imposed by the WestMedMAP.

Additionally, EWG 21-13 observed that data is required to test the efficacy of spatial closures on both juveniles and spawners, to identify hotspots and relate them to the distribution of trawling and passive gear fishing activity. The EWG identified some difficulties in using the MEDITS scientific trawl survey data for this purpose, as it does not provide a complete description of these spatial distributions (for the same coverage limitation reasons described in the MEDISEH report above).

STECF comments

1. Evaluation of new proposed closures

STECF is requested to review any proposals of additional closures (placement and period) submitted by Italy and assess whether those closure areas show evidence of high density of juveniles and species' spawning grounds covered by Regulation 2019/1022 Art 1.

STECF observes that, while Art 11.1 and 11.2 target the protection of juvenile hake, the objective of additional closures described in Art 11.3 also applies to by-catch stocks caught in the western Mediterranean Sea when fishing for the stocks listed in Art 1.2 (i.e. for GSA 9-10-11. Those stocks are deep-water shrimp, giant red shrimp, European hake, Norway lobster, and red mullet, and any other by-caught stocks by the demersal fisheries in the western Mediterranean Sea). It also applies to any other demersal stock caught in the western Mediterranean Sea and for which sufficient data are not available.

STECF observes that no additional closures are proposed by Italy in the present request. Instead, Italy provided the descriptive characteristics of currently enforced Italian FRAs in the area to support compliance with the requirements of the Regulation Art. 11.3. The closed areas discussed in the supporting document correspond to the FRAs already implemented since August 2020 in each of the GSAs exploited by the Italian fleet.

STECF observes that the characteristics of the existing FRAs, as documented in the background documents, provide only qualitative information about the potential overlap of each of these FRAs with some areas of high densities of juveniles and/or adults. However, STECF stresses that the high densities areas should instead be used to design the closed areas to be proposed, rather than the other way around as currently proposed by Italy. STECF observes that protecting Art.1 species was likely not the primary goal in these FRAs, as they were primarily designated to protect juvenile hake (as described in Art 11.2). Therefore, STECF observes that no technical report or data is provided that would support the use of the existing FRAs for a different objective rather than the initial one of protecting juvenile hake.

STECF notes that the supporting documentation is not sufficient to carry out an evaluation. Although, STECF acknowledges that no quantitative criteria is mentioned in the Regulation Art 11.3, it is not sufficient to provide only qualitative statements about the possible overlap between FRAs and stock distributions. It can neither be considered adequate to base the qualitative assessment solely on historic information from older scientific papers, and without providing STECF with any detailed description on how these qualitative statements were reached (tables and maps etc).

STECF also recalls that the aforementioned Italian FRAs were already assessed extensively in a previous STECF expert working group (EWG-21-01) regarding their ability to reach the objective of reducing the unwanted catch of juvenile hake by 20% as described in Art

11.2. Regarding the outcome of this EWG, STECF PLEN 21-01 concluded that none of the proposed scenarios of additional closures achieved the objective of reducing the unwanted catch of juvenile hake by 20%, or reducing the catch of juveniles and spawners by of each stock covered by the WMMAP between 15% and 25%.

2. Suggestion for complementary studies and suitable scenarios on designing new closures (as referred in art 11.3) ahead of a next EWG

In case the proposed closures are not meeting the criteria of the MAP provisions, STECFwas asked to suggest ways of improving the proposals such as identifying published literature with studies on alternative closures (placement and period) for Italy.

STECF observes that suggesting and evaluating adequate placement for closed areas that would be tailored to the local context of GSAs visited by the Italian fleet is out of the scope of a STECF plenary. However, STECF can advise on the best approach to follow and, in this respect, recalls that the evaluation of alternative closure scenarios should follow the technical guidelines provided by STECF PLEN 19-03 and STECF 20-01, which are based on the best available approaches identified in the literature.

STECF acknowledges that designing spatio-temporal closures and assessing their effects is not straightforward, as many factors are at play. STECF stresses that the identification of nursery grounds and spawning aggregation areas of exploited stocks is a key requirement for the development of spatial conservation measures that would be effective at reducing the adverse impact of fishing on the exploited populations and ecosystems. Hence, STECF suggested a roadmap for identifying and testing the effects of closure areas (for further methodological details and recent literature studies see: for example Colloca et al. 2015, Despoti et al. 2020, Milisenda et al. 2021 for the GSAs visited by the Italian Fleet, or Izquierdo et al. 2021 in the GSAs visited by the Spanish fleet) as follows:

a) define recruits and spawners (a number of assumptions can be made to identify thresholds for these two categories);
b) estimate the distribution of recruits and spawners densities in different seasons using fishery-dependent and fishery-independent data;
c) identify hotspots (i.e., areas with higher density) of recruits and spawners using several modelling approaches depending on species, season and area;
d) verify the spatial and temporal persistency/stability of such hotspots;
e) evaluate the importance of each area in a multispecies context by analysing the spatial overlap among the persistent hotspots for several species (areas including nurseries and spawning aggregations for multiple species should be considered as highest priority areas);
f) define a number of closure areas scenarios prioritizing areas with overlapping hotspots and gradually increasing their spatial extensions, for example by ranking the areas in decreasing order of cumulated density of the species of interest;
g) evaluate the effect of such scenarios (closure areas) in reducing juveniles and spawners in catches along with effort redistribution. This is either done with short term static and deterministic evaluation (g.1), or ideally through a dynamic modelling (g.2) for validating the trend on the long term, accounting for the possible compensatory effects, and operating cost dynamics.

Following this roadmap, it could be possible to optimize spatial management objectives for demersal fisheries by identifying the precise location and extension of closure areas that would achieve a given reduction of juveniles and spawners in catches, provided that hotspots areas can be identified.

STECF observes though that it remains a challenge to demonstrate the existence of adult fish aggregations in this area. The aggregations or hot spots that have been identified are primarily the areas where juvenile hake would aggregate ("nursery areas"). Recent studies found that there is evidence of some persistent areas for juveniles of other species. For example, Milisenda et al. (2021) confirmed quite high stability of the density hot spots of undersized juveniles of demersal species as already observed for the nursery areas in the North Mediterranean Sea (Colloca et al. 2015). However, to STECFs knowledge, there is little evidence for aggregations of spawners. Adult hake, and probably other species, can be found over a wide depth range, mainly on the upper slope, from 200 to 500 m depth (Sbrana et al., 2007).

STECF notes that this raises important questions. Without aggregations of adults identified, STECF acknowledges that only very large spatial closures may ever meet the full requirement of Art 11.3 to establish closure areas of spawning grounds of demersal stocks, and maybe also of Art 11.2 to protect juvenile hake as indicated by EWG 21-01. This may prevent any successful option for triggering the derogation to Art 11.1. In this case, STECF observes that Art 11.1 would thus apply, which would include a 3-month closed season of the 6nm coastal strip.

As juvenile hake and other species might also distribute in this coastal strip, this might contribute to addressing protection for other demersal species concerned by Art 11.3. However, STECF recognises that the 6nm coastal strip will likely be insufficient to cover and protect the adult fish, which distribute in deeper waters. The closure of the 6nm strip may mainly benefit red mullet, which is already exploited at Fmsy. There is also a risk of displacing fishing effort to the deeper grounds where already over-exploited resources can be found (e.g. hake) while protecting adults would likely promote rebuilding population fecundity (Caddy 2015). Additional closed areas would then need to be implemented to achieve the objectives, for example a seasonal closure of all fisheries including gillnetting and longlining targeting hake during spawning period, whenever a clear peak can be found.

- *Further considerations on the identification of areas with species persistence (points a to f) and short-term (static) evaluation (point g.1)*

The identification of areas should be focused on highly productive patches (for nurseries) and on dense concentrations of spawners (for spawning areas), if such areas exist. In addition to what is discussed above, STECF observes the difficulty to identify adult fish aggregation may also partly result from survey and commercial data that are too sparse to demonstrate the existence of such aggregations. For the particular case of identifying spawning aggregations for some species, STECF EWG 21-13 noted that this is challenging based only on information from trawl surveys. The only trawl survey targeting demersal species in the Mediterranean is the MEDITS. Spawning peaks and MEDITS trawl survey timing do not match for certain species (e.g., hake, MEDISEH, 2013). Spawners' low catchability with the MEDITS gear is also an issue. In these cases (e.g., hake spawners), it would be advisable to evaluate the possibility to adopt alternative methods for analysing geo-referenced catch data coming from passive gears (e.g., onboard observers, VMS, AIS, logbooks, etc.). EWG reported that a potential roadmap for identifying the spawning aggregation hotspots e.g. for hake could be:

    - collecting VMS/AIS data for vessels using LLS, GNS and GRT (e.g., by modelling the behaviour of fishers based on the VMS tracks and speeds);
    - for LLS, select only bottom longlines (i.e., by excluding vessels targeting large pelagics);
    - identifying the main fishing grounds (e.g., by persistence analysis over

the last 5 years, if possible);

- associate landing data by species with fishing grounds.

Using complementary data and deploying a hotspot persistency analysis adapted to the Western Mediterranean context would be then particularly useful. This is because the MEDITS survey is physically restricted to areas suitable for bottom trawling, whereas the spatial distribution of many stocks covers a mosaic of habitat types. Alternative methods might also be deployed for predicting juvenile or spawner distributions for the demersal species, which could also include multicriteria analysis that could generate habitat suitability maps deduced from linking species distribution to environmental drivers (e.g., Kavadas et al. 2015), (e.g. sea surface temperature, bathymetry, etc). STECF observes that such drivers of demersal species distribution are also described in the MEDISEH report by GSA.

STECF notes that combining survey and commercial catch data to identify hotspots has been applied in several contexts and sometimes without deploying data- and resource-demanding dynamic bio-economic models (i.e. for the steps (g)). For example, such an approach has been undertaken in the Celtic Sea (this PLEN 21-03 ToR 5.8 reporting on EWG 21-18). Both fisheries-independent and fisheries-dependent data were used to provide complementary information to address the limitations in coverage of the scientific survey data. Such an approach has also been investigated for the Adriatic Sea (STECF EWG 19-02).

STECF acknowledged in previous plenaries that imposing very large closures may not always be politically acceptable due to the associated socio-economic impacts on fisheries. To identify suitable areas for spatio-temporal closures with consideration of the trade-off between efficiency and the economic short term impact, optimization approaches could be developed that would investigate how best to reduce the unwanted catches along with a gradient of catch reductions needed, expressed as a fraction of the total catch. Combinations of the month and areas that would reduce the catch of juveniles or spawners could be identified by ranking the areas in decreasing order of cumulated density of the species of interest while minimizing the loss of total revenue of the fleet (see again for example EWG 21-18 in the Celtic Sea). Additionally, considering that the displacement of fishing effort may deplete adjacent areas faster, prioritizing the protection of overlapping persistent hotspots could minimize the negative impact from effort redistribution.

- *Medium to long-term validation of candidate closures (point g.2)*

STECF observes that the bio-economic modelling approach used in EWG 21-01 and followed up in EWG 21-13 is sound. Any static catch reduction analysis applied to persistent areas will only picture immediate changes in catches compared to a baseline but does not investigate the changes over the medium and long term. Given the changes over time in harvested resource distribution and fishing effort allocation, STECF supports that fishing closures are best evaluated in an integrated manner. They should also be re-assessed periodically to adapt to such changes in resource distribution and fishing effort allocation, and the bio-economic models updated and re-run regularly.

STECF observes that static evaluations can also be used as a first step to identify valuable candidate(s) for closed areas before further testing. More advanced dynamic bio-economic models can subsequently be employed to project the effects of closures proposed on the medium to long term by evaluating the impact of the potential increase of biomass productivity and the possible spillover effect from closure areas through the ability of species to disperse or migrate. They can also take into account the potential impact of the

closures on the biomass in those areas still open to fishing, and consequently the impact of the compensatory effects from fleet adaptations.

Multi-fleet modelling approach can also bring important considerations to validation of closures. For instance, EWG 21-13 identified that "*excluding trawlers from spawning aggregations would likely favour the activity of set netters and longliners (i.e., active and passive gears cannot coexist in the same areas at the same time), whose gears are more efficient in catching large specimens if compared with trawling. EWG 21-01 evidenced that for hake and red mullet other gears than trawling (LLS, GNS and GTR) contribute considerably to fishing mortality mostly for older age classes (spawners). Hence, a reduction of fishing mortality from these fishing gears (LLS, GNS, GTR) would maximize the contribution of such a conservation measure to the protection of spawners if fishing effort of these gears would be managed during the months of spawning peaks, which are winter-spring (December to May) for hake and spring-summer (April to August) for red mullet*."

Finally, spatially-explicit bioeconomic models adapted to the amount of knowledge and geo-referenced data available can also help capture fishing effort displacement more accurately., As noted in EWG-21-13, these displacement models range from the simplest (i.e. homogeneous redistribution, bathymetric weighted redistribution, gravimetric redistribution) to more complex frameworks that can explicitly integrate the spatial dimension in an individual-based simulator of fishery closure scenarios with biological and effort feedbacks.

STECF observes that the procedure described above follows the modelling work done for the Western Mediterranean area by EWG 21-01. However, the scenarios investigated by this EWG were limited to the 10 FRAs that Italy established in August 2020. These closed areas alone were shown to be insufficient to reach the objective of reducing the catch on juvenile hake, and will thus neither protect adequately the other species covered by Art 11.3. STECF notes though that the existing modelling plateforms are adequate to investigate, with only limited model update, any new scenario following the approach above, to design adequate closed areas that would comply with the objective of catch reduction of juveniles, as well as ensuring protection for spawners aggregation areas.

3. A draft ToR to include in a next EWG for testing relevant scenarios to Regulation (EU) No 2019/1022 Art 11.3

DG MARE informed STECF on the background for a possible future request that would require STECF to arrange a further EWG to address, as follows:

"*In adopting the western Mediterranean multi-annual management plan, Member States agreed to Article 11.1, alternatively Article 11.2, that aims at protecting juveniles of hake. All three concerned Member States also adopted Article 11.3 and agreed to establish other closure areas by 17 July 2021 and on the basis of the best available scientific advice, where there is evidence of a high concentration of juvenile fish, below the minimum conservation reference size, and of spawning grounds of demersal stocks, in particular for the stocks concerned. In addition, France and Spain adopted in December 2020 targets of bycatch reductions for juveniles and spawners of demersal stocks and committed to reduce between 15% and 25% the bycatch of those in each GSA*.

STECF PLEN 19-03, PLEN 20-01 and STECF EWG 21-01 have reviewed the proposals of

closures (placement and period) submitted in 2020 and 2021 by the three Member States and have determined their efficiency to protect juveniles of hake (as planned in Article 11.2) and juveniles and spawners of all demersal species in the western Mediterranean (as planned in Article 11.3).

However, in view of Article 11.4, these closure areas should be reviewed so that Member States can update the closure areas based on STECF advice."

The request to the STECF for this EWG would tentatively consist of:

"Reviewing any closure submitted by the 3 Member States by the start of the EWG and determine their efficiency to protect both juveniles and spawners of all demersal species covered by the West Med MAP as well as considering potential fishing effort displacement. This would consist in developing mixed-fisheries spatio-temporal scenarios for all demersal fishing gear (e.g. bottom trawls, gillnets, longlines) in EMU1 and EMU2 with simulations from 2020 to 2030. The STECF evaluation should consider differences in catch reduction to the situation in 2019 (prior to closure adoptions) by species and by age-class and the following scenarios:

a. *Status quo scenario: closures adopted in 2020 and 2021 by the 3 Member States*
b. *Same delineation of closures areas as in 2020 and 2021 and all closure areas becoming permanent in 2023*
c. *Same delineation of closures areas as in 2020 and 2021 and all closure areas applying to all fishing gears (e.g. trawlers, longliners, netters)*
d. *10% of total surface area as a permanent closure areas in each GSA with 50% in waters shallower than 200m depth, and 50% in waters deeper than 200 m depth*
e. *20% of permanent closure areas in each GSA with 50% in waters shallower than 200m depth, and 50%in waters deeper than 200 m depth*
f. *30% of permanent closure areas in each GSA with 50% in waters shallower than 200m depth, and 50% in waters deeper than 200 m depth*"

- STECF comments that, as an alternative, three depth strata may be considered in the points d), e) and f): up to 200 m, 200-500 m, and above 500 m; closure areas may be allocated proportionally.

- STECF notes that the best candidate area for closures might be based on the approach described above. In any case, the identification of aggregation/hotspot areas should be completed before the next EWG as preparatory work in order to produce the spatial layer which could then be used for testing the different scenarios with spatially explicit bio-economic models during the EWG.

- STECF observes that testing larger closure areas than the ones tested in previous EWGs is based on the rationale that several international commitments have been taken by Member States and the EU in recent years to protect a certain percentage of their marine territories. The Aichi target 11 is one of those commitments, and the EU Biodiversity Strategy is another. The latter aims at protecting 30% of EU waters by 2030, including 10% of EU waters being under strict protection.

- STECF recalls that, in addition to this, there are challenges in enforcing small closed areas to fishing, because the fisheries data are usually not disaggregated enough to match the spatial resolution of these areas. Such a difficulty would support the need for more ambitious (i.e. larger) closures, which would be easier to monitor.

- To provide a measure of the efficiency of the closures, DG MARE has set the objective of reducing the catch of juveniles and spawners of each target species in each

GSA by about 20% of the catch. This is aligned with the objective defined of reducing the catch of juvenile hake (if Art 11.2 applies). In addition to the West Med MAP, 2 Member States (France and Spain) adopted in December 2020, statements which now form part of the European legislation corpus. Those commitments are aligned to the quantitative objectives of article 11.2 and article 11.3. Namely, FR and ES committed to achieve a 15% to 25% reduction of (by)catch of demersal stocks, juveniles and spawners, for each GSA.

- Time permitting, for each GSA, in case the closures proposed by Member States are not meeting this criterion, the EWG could be requested to propose recommendations for designing alternative closures based on criteria such as but not limited to, bathymetry, depth, type of substrate, stock seasonality, the establishment of a buffer area, minimal size of the closure area etc.

STECF conclusions

Current proposal for additional closures to address Art 11.3 requirements

STECF concludes that Italy has not provided enough supporting information or data to respond fully to the request related to suggesting additional closures for protecting juvenile and spawners aggregation of species covered by Art 11.1 of the "WMed MAP" Regulation (EU) No 2019/1022 in GSAs 9-10-11.

Complementary investigation needed for identifying suitable candidate areas

STECF concludes that the proposed generic roadmap for optimizing spatial management objectives for demersal fisheries, by identifying the precise location and extension of closure areas for a given objective of catch reduction of juveniles and spawners in catches and ranking priority areas, would allow estimating the gradual cumulated benefits and trade-offs for increasing levels of closed surface. STECF concludes that this ranking could help identify candidate scenarios, which would then need to be evaluated following the technical guidelines provided by STECF PLEN 19-03 and STECF 20-01.

STECF concludes that additional data is needed to improve the analysis of hotspot persistency, especially complementary available fisheries-dependent data that would fill the coverage gaps of the MEDITS trawl survey. STECF concludes that, once these data are collated, they can be incorporated into the existing modeling platforms to run scenarios related to Art 11.3 for anticipating the effects on each stock covered by the WMMAP.

STECF concludes that an essential element in the evaluation of closed areas is to include the effects of effort displacement. There is a risk that the closure may not reduce the overall fishing pressure, but merely lead to effort displacement in an attempt for fishers to maintain stable catches levels on the targeted species. STECF emphasizes that effort displacement might not only take place toward other fishing grounds, but also possibly toward other gears, other species and other habitats.

A new simulation study required in a next EWG specifics to Art 11.3

STECF concludes that, as already concluded in PLEN 21-01, achieving protection by means of closures alone would require more ambitious scenarios, adapted to the areas, fisheries and species concerned. To this end, STECF has reviewed a draft ToR proposed by DG MARE for a next EWG (Spring 2022) covering new scenarios related to Art 11.3. STECF

concludes that the new scenarios for closures are proposed by DG MARE are ambitious, aiming for closures more effective at reducing catches of juveniles and spawners of all the demersal species covered by Art 1 of the Regulation (EU) No 2019/1022.

Alternatively, STECF recalls that the combining closure areas with selectivity improvement is more likely to contribute to achieve the requirements of the Regulation of reducing unwanted catch levels; see also the outcomes of EWG 21-07, ToR 5.2 of this plenary report.

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6.5 Follow-up of EWG 21-13: West Med management: evaluation of baselines

Background provided by the Commission

In adopting the Western Mediterranean multi-annual management plan (West Med MAP), Member States agreed to:

- Article 7.3.b, that states: "for the second to the fifth year of the implementation of the plan, the maximum allowable fishing effort shall be reduced by a maximum of 30 % during that period. The fishing effort decrease may be supplemented with any relevant technical or other conservation measures adopted in accordance with Union law, in order to achieve the FMSY by 1 January 2025."
- Article 7.5 that states: "Where the best available scientific advice shows significant catches of a particular stock with fishing gear other than trawls, maximum allowable fishing effort may be set for such particular gear on the basis of such scientific advice."

STECF EWG 21-01 has looked at the impact of other fishing gear on the fishing mortality of demersal stocks. STECF EWG 21-11 and STECF EWG 21-13 have assessed demersal stocks in the western Mediterranean and evaluated the biological and socio-economic impacts of various management scenarios.

Request to the STECF

STECF is requested to complete Table 2.1.1 provided in STECF report EWG 21-13 that looks at the time series of fishing effort between 2015 and 2020 in the western Mediterranean Sea. The table should be completed by the calculation of the annual average of fishing days by fishing gear, by Member State and by fleet segment (< 12m, 12m to 18m, 18m to 24m, > 24m). This average should be calculated between 2015 and 2017, the legal reference period in the western Mediterranean multi-annual management plan, and use the DCF FDI data call.

STECF is requested to update the annual data on fishing effort provided in section 5 and section 6 of the EWG 21-11 report (Stock assessments in the Western Mediterranean Sea 2021). Effort data will be based on the FDI database (Table G). This should be described in terms of time (days at sea and/or fishing days) and/or fishing power.

STECF response

In response to the request, fishing effort data were updated with JRC support.

STECF already endorsed the EWG 21-13 report through written procedures. The new tables/data were thus added on the STECF website of this EWG as an electronic annex in

which this information is stored as zip file. The main information is also presented in section 9 ANNEXES to this report.

Regarding the request for EWG-21-11 table, the fishing effort update was inserted in the report before publication.

6.6 Review of national management plans for boat seines in the Gulf of Manfredonia (Apulia, Italy)

Background provided by the Commission

In January 2021 the Italian Administration has expressed its intention adopt a new management plan for the transparent goby (*Aphia minuta*) fishery with boat seines in the Gulf of Manfredonia (Apulia, Italy). This plan envisions the renewal of the derogation from EC 1967/2006 article 9/13 in terms of distance and minimum depth from the coast, which is currently granted with the Regulation12 (EU) 2018/1634 of 30 October 2018. The current derogation already expired on 2 March 2021.

STECF PLEN 21-01 and 21-02 evaluated the national plan submitted by Italy and raised a number of data deficiencies and methodological issues. MARE has subsequently requested to Italy to an in depth revision of the national plan in question in light of STECF conclusions.

Request to the STECF

TOR 1. Advice and assess whether the updated management plan boat seines targeting transparent goby in the waters of the Gulf of Manfredonia (Apulia, Italy) contains adequate elements in terms of:

1.1. The description of the fisheries

- Biological characteristics and state of the exploited resources with reference in particular to long-term yields.
- Description of the fishing pressure and measures to accomplish a sustainable exploitation of the main target stocks.
- Data on catches (landings and discards) of the species concerned, fishing effort and abundance indices such as catch-per-unit-effort (or CPUE).
- Catch composition in terms of size distribution, with particular reference to the percentage of catches of species subject to minimum sizes in accordance with Annex IX of Regulation (EU) 2019/124113.

12 Commission Implementing Regulation (EU) 2018/317 of 2 March 2018 establishing a derogation from Council Regulation (EC) No 1967/2006 as regards the minimum distance from coast and the minimum sea depth for boat seines fishing for transparent goby (Aphia minuta) in certain territorial waters of Italy /2018/1221 http://data.europa.eu/eli/reg_impl/2018/317/oj.

13 Regulation (EU) 2019/1241 of the European Parliament and of the Council of 20 June 2019 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022 of the European Parliament and of the Council, and repealing

- Information on the social and economic impact of the measures proposed.
- Potential impact of the fishing gear on the marine environment with particular interest on protected habitats (i.e. seagrass bed, coralligenous habitat and maërl bed);

1.2. Objectives, safeguards and conservation/technical measures

- Objectives that are consistent with the objectives set out in Article 2 and with the relevant provisions of Articles 6 of CFP14 Regulation and quantifiable targets, such as fishing mortality rates and total biomass.
- Objectives for conservation and technical measures to be taken in order to achieve the targets set out in Article 15 of Regulation (EU) No 1380/2013, and measures designed to avoid and reduce, as far as possible, unwanted catches.
- Measures proportionate to the objectives, the targets and the expected time frame.
- Safeguards to ensure that quantifiable targets are met, as well as remedial actions, where needed, including situations where the deteriorating quality of data or non-availability places the sustainability of the main stocks of the fishery at risk.
- Other conservation measures, in particular measures to gradually eliminate discards, taking into account the best available scientific advice or to minimise the negative impact of fishing on the ecosystem.

1.3. Other aspects

- Quantifiable indicators for periodic monitoring and assessment of progress in achieving the objectives of the plan.

TOR 2. Evaluate whether the following conditions set by the MEDREG are fulfilled:

2.1 Derogation to the distance from the coast (Article 13 – Paragraphs 5, 9 and 10)

- There are particular geographical constraints, such as the limited size of the continental shelf along the entire coastline;
- The fisheries have any significant impact on the marine environment;
- The fisheries involve a limited number of vessels and do not contain any increase in the fishing effort;
- The fisheries cannot be undertaken with another gear;
- The fisheries are subject to a management plan and carry out a monitoring of catches as requested in Article 23;
- The vessels concerned have a track record of more than 5 years;
- The fisheries do not interfere with the activities of vessels using gears other than trawls, seines or similar towed nets;

Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.

14 Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC.

- The fisheries are regulated in order to ensure that catches of species mentioned in Annex IX of Regulation (EU) 2019/124115 with the exception of mollusc bivalves, are minimal
- The fisheries do not target cephalopods.

2.2 Derogation to the minimum mesh size (Article 9, paragraph 7)

- The fisheries are highly selective and have a negligible effect on the marine environment; and
- The fisheries do not operate above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams.

STECF response to the ToRs

STECF examined the new version of the MP submitted in October 2021 and compared it with the previous versions of the MP submitted in March and June 2021 and reviewed by STECF PLEN-21-01 and PLEN-21-02, respectively. After discussion in Plenary, it was agreed to respond only to the latest changes made in the MP rather than respond to the ToRs in a point-by-point manner (which would have largely replicated the work done in PLEN-21-01).

Summary of information provided and of previous STECF comments

Background documents are published on the meeting's web site on: https://stecf.jrc.ec.europa.eu/plen2103

STECF has received two documents:

1. "National Management Plan for derogation to mesh size and distance from the coast (reg EU 1241/2019 annex IX, part b and reg EC 1967/2006, art 13) regarding the fishing of transparent goby (*Aphia minuta*) by boat seines in the Manfredonia fishing district"

2. "REVIEW OF NATIONAL MANAGEMENT PLANS FOR BOAT SEINES IN THE GULF OF MANFREDONIA (APULIA, ITALY)"

The first document is the new revision of the management plan (MP).

15 Regulation (EU) 2019/1241 of the European Parliament and of the Council of 20 June 2019 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022 of the European Parliament and of the Council, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.

The second document (document #2) describes the changes made to the MP in response to the specific comments of STECF PLEN-21-01 and PLEN-21-02.

STECF recalls that the transparent goby fishery in the Gulf of Manfredonia was originally carried out using bottom otter trawls. However, following the implementation of MEDREG, fishing of transparent goby with trawls stopped in 2010. In the period 2012-2015, national pilot projects were initiated to determine the feasibility of using boat seines as an alternative capture method. These national projects aimed at training the local fishermen (those involved in the previous trawl fisheries) and conducting experimental fishing using seine nets, similar to those utilized in GSA 9 (Ligurian Sea and Northern Tyrrhenian Sea). In 2018-2020, the boat seine fishery re-opened, under an approved management plan (Table 6.6.1).

Table 6.6.1. Summarized information on boat seine fisheries for transparent goby in the Gulf of Manfredonia.

Year	Fishery	N. of vessels authorized	Total N. of days with boat seine fishing	Total N. of days-at-sea	Average N. of vessels operating each day with boat seine fishing	Mean CPUE (catch/day)
2012	Training	3	5			
2013	Experimental	100	41	961	23	51.8
2013	Training	2	7			
2014	Experimental	100	24	276	12	63.1
2015	Experimental	100	32	179	6	26.1
2018	Management plan	100	29	330	11	64.7
2019	Management plan	100	24	234	10	57.5
2020	Management plan	100	38	301	8	56.9

The main comments from STECF PLEN-21-01 and PLEN-21-02 and the revisions made in the MP in relation to these comments are summarized below:

1. CPUE trigger

In the previous versions of the MP, CPUE trigger values based on historical bottom trawl data for the period 2005-2010 were used as reference points (25-percentile: 15/kg/vessel/day and 50-percentile: 19/kg/vessel/day, in March and June versions of the MP, respectively). STECF PLEN 21-01 and PLEN 21-02 noted that the catch rates of bottom trawls were much lower than those of boat seines and STECF emphasized that a new CPUE threshold should be defined based on the current situation and the most recent boat seine time series.

STECF PLEN 21-02 also noted that daily CPUEs can be highly variable, affecting perceptions of true stock abundance in the short-term and suggested that a statistical analysis of daily CPUEs be presented that estimates the appropriate time intervals for in-season management reactions and shows evidence of the robustness of the proposed alarms to separate true signal from noise. Furthermore, STECF considered that, based on generic knowledge on stock assessment and seine fishery dynamics, a 25% quantile threshold (as set in the March version of the plan) is unlikely to be fully in line with the MSY objective of the CFP.

In response to these comments, an analysis is now presented in the MP of the daily CPUEs, daily effort (number of vessels) and daily landings data for the latest three fishing seasons (2018-2020). Plots of CPUEs, mean daily CPUE and effort are shown in relation to calendar day and the relationships between total daily catches and mean daily CPUE against the fishing effort are also provided. Based on the daily CPUE data of 2018-2020, the average, median, 25-percentile and 35-percentile are computed (Table 6.6.2). Table 6.6.2 is included in the MP (page 53, Table 15), however, using the raw data (provided in Tables 26, 27 and 28 of the MP), STECF calculated again the averages, medians and percentiles and confirmed their correctness.

Table 6.6.2. Average, median, 25-percentile and 35-percentile of the recorded catch of transparent goby (kg day^{-1}) in the Gulf of Manfredonia in the fishing seasons between 2018 and 2020.

Year	Average	Median	25-percentile	35-percentile
2018	64.71	60	31	40
2019	57.54	40	25	30
2020	56.87	46.25	30	36
Total	59.85	50	30	35

Based on the overall data (35-percentile), a new Limit Reference Point (LRP) CPUE trigger is now set at 35 kg/vessel/day.

2. Harvest control rules

STECF PLEN-21-01 and PLEN-21-02 commented that the exact management actions to be taken once the CPUE observed in the fishery drops below the management trigger had not been pre-defined and specified in quantitative manner in the MP.

In the revised version of the plan, harvest control rules have consequently been revised as follows:

Two "alert" situations are defined:

1. The daily average CPUE falls below 35 kg/vessel/day for 3 consecutive days.
2. The daily average CPUE falls, four times within 2 consecutive weeks, below 35 kg/vessel/day.

Since the fishery is allowed from Monday to Thursday, until 18:00, each week's CPUE data will be processed on Friday and:

- In case 1 (daily average CPUE below the LRP for 3 consecutive days) → the fishery will be suspended for one week.
- In case 2 (daily average CPUE below the LRP for 2 times within 2 consecutive weeks days) → the fishery will be allowed only for 2 days, Monday and Wednesday, in the following 2 weeks.

Additionally, it is mentioned that further corrective actions can be taken, "*concerning the fishing period, the number of vessels effectively in operation, the value of the daily average CPUE recorded and the other biological parameters considered as important for the general evaluation. Where necessary, the Control entity can decide for the temporary suspension of the activities or, if necessary, an early closure*".

3. Effort restrictions

In the previous versions of the MP, STECF noted that the proposed combination of effort restrictions (7 months fishing season × 4 weeks × 4 days × 30 vessels daily) allowed for about 3360 maximum potential fishing days. Given that the average number of total days-at-sea was about 300 in 2018-2020 (Table 6.6.1), there was therefore room for expanding up to 11 times (3360/300) the recent levels of fishing effort. Although STECF understands that the total fishing effort may not be fully used because of other constraints (e.g. market demand, weather conditions, etc.), STECF emphasized that more realistic limits should be imposed on the total number of authorized vessels as well as the days-at-sea allowed to the authorized fleet.

Subsequently, in the revised version of plan (October) the number of authorized vessels was reduced to 60 (Table 6.6.3). Additionally, a ceiling was imposed to the maximum

number of days-at-sea permitted for the fishing fleet during the fishing season (600) (Table 6.6.3).

Table 6.6.3. Effort restriction measures contained in the 2021-versions of the MP. This table was compiled by STECF to facilitate comparisons of the changes made.

Effort restriction	**March version**	**June version**	**October version**
Number of authorized vessels	80		60
Maximum number of vessels operating daily	30		
Fishing season	7 months (November – May)		
Maximum fishing days per vessel per season	60		
Maximum fishing days per season	No ceiling		600
Weekly limitation	4 days per week (Monday - Thursday)		
Working time limitation	06:00 - 18:00		

4. Bycatch, discards and socioeconomic data

According to the MP, the monitoring of the plan will include:

- surveys on board the fishing fleet by scientific personnel;
- filling a catch data form or logbook daily with data on all catches (fishing area, number of fishing operations, goby catch, bycatch etc.),
- collection of socio-economic data (income, employment etc.).

STECF PLEN-21-02 noted that although the plan in force for the 2018-2020 period already stipulated the collection of bycatch, discards and socioeconomic data, no such information had been provided.

In the new version of the MP, the following information is now added:

- Three large Tables (Tables 29-30-31) showing by-catch weight (kg) per fishing day of each fishing vessel and;
- A new Annex (Annex 3) with numerous Tables showing, for each individual fishing vessel and year, the catch weight (kg) of five species, namely, *Loligo vulgaris*, *Trachurus* spp., *Boops boops*, *Merluccius merluccius* and *Parapenaeus longirostris.*
- Three Tables (Tables 32-33-34) showing the revenue per vessel for 2018, 2019 and 2020.

Regarding the socioeconomic data collection, it is mentioned that it was not possible to conduct a survey in 2018-2020, but this is planned for the next period. Furthermore, that information available for the period 2018 – 2020, indicate a "*medium price paid to the producer equal to € 17,00/kg*".

5. Modifications made to the gear and the vessels

On page 57 in the original MP (March version), it was stated: "*On account of the knowledge acquired during the two years of experimentation, the fishers from Manfredonia implemented*

some changes to the structure of the seine, adapting it to the characteristics and the operative

requirements of their vessels." STECF PLEN-21-01 noted that no technical specifications regarding changes made to the net and to the vessels (e.g., winch, engine, propeller pitch, ecosounder) had been provided in the plan. Images and videos recorded during the fishing operations (following the example of the Sonsera fishery MP in Catalonia) could provide a helpful picture of the transparent goby fishery in the Manfredonia Gulf. In the June version of the MP, STECF PLEN-21-02 noted that the aforementioned sentence ("*On account of (…)*") had been deleted.

In the new version of the plan (October), STECF observes that no additional gear information is provided. In the document #2, it is though explained that the reason for deleting the aforementioned sentence was that the sentence was vague. Paraphrasing the sentence, it is explained that: "*The fishers of Manfredonia, during the two years of experimentation, have acquired their own knowledge of the procedure and methods to perform the fishing activity with this gear, and they have found their optimum of operating parameters to maximise their efforts, i.e. the length of the ropes, adapting each vessel operations.*" It is also clarified in document #2 that: *"the gear hasn't been under any form of structural or technical modification and its technical definitions are reported …"* in the MP. STECF notes that, in the MP (document #1), it is also stated that: "*Transparent goby fisheries do not require the mechanical or electronic support devices that are necessary for bottom trawl fisheries, the only such equipment required is a small mechanical winch.*" Additionally, it is said that: "*During the phases of circling and lowering the net the vessel's speed is always low (1-2 knots) and there is no movement at all during the catch of the shoal. This differs substantially from the speed of fishing during bottom trawl (3-4 knots)…*" and "*…the catch technique is based on net recovery, instead of trawling and towing*". From these descriptions, it might be assumed that the fishing method used in Manfredonia is similar to the one in GSA 9.

STECF comments

STECF acknowledges the usefulness of the detailed answers to previous comments (document #2) to ease the evaluation of the updated MP.

STECF notes that the recent time series of data from the boat seine fishery is short (2018-2020), which represents an impediment to assessing the status of the transparent goby stock in the Gulf of Manfredonia. The definition of a new CPUE trigger, at the 35-percentile of the recent boat seine CPUEs (2018-2020), is more precautionary as a management

option than using the CPUEs from the past (2005-2010) trawl fishery, characterized by significantly lower catch rates.

STECF also notes that variability in daily CPUEs values is high and can be affected by factors such as the timing of recruitment and/or weather conditions. STECF reflected upon whether the time intervals proposed in the MP for in-season management reactions (e.g., three consecutive days in "alert" situation 1 -see above) might therefore be considered short and may result in numerous alerts and frequent fishery closures, keeping also in mind that in similar management plans in Spain and Italy (e.g., the Murcia *Aphia minuta* MP [STECF-16-15] and the Ligurian (GSA 9) MP [STECF PLEN-21-01]), CPUE triggers and remedial actions have been defined on a monthly (Murcia) or even annual (Liguria) basis. STECF thus examined the CPUE data in the Manfredonia Gulf for 2018-2020 (330, 234 and 301 days-at-sea corresponding to 29, 24 and 38 days with transparent goby fishery in 2018, 2019 and 2020, respectively) and observed that the daily average CPUE had rarely been lower than 35 kg/vessel/day in these years (specifically, it was lower in only one fishing day in 2018, 5 days in 2019 and 3 days in 2020). Applying the remedial actions described in the plan, no cases of alarm (daily average CPUE below the LRP for 3 consecutive days, or, daily average CPUE below the LRP for 4 times within 2 consecutive weeks) were detected in any of the three fishing periods. STECF considers therefore that, if stock abundance and availability remain similar in future fishing seasons, the short time intervals proposed in the MP for management reactions may not necessarily lead to frequent fishery closures, but may conversely be appropriate to rapidly detect changes in the resource.

STECF notes that "case 1" alarm refer to "consecutive" days. Considering that the fishery does not operate every day, STECF considers that the meaning of "consecutive" should be fully clarified, i.e. whether it is meant consecutive calendar days regardless of the number of vessels fishing, or consecutive fishing days with at least one vessel fishing.

STECF notes that the MP foresees a "*real-time*" data collection: "*The Organizzazione dei Produttori Ittici Sud Adriatico (O.P.) shall collect daily the logbooks or the record forms compiled by the fishermen and forward them to the scientific body, within 48 hours from the landing*". STECF notes though that this time frame (48 hours) is not well aligned with the intention to compute alert values every Friday, as it is unclear whether CPUE data collected on Wednesday and Thursday will be available to calculate the average CPUEs.

STECF notes that, from the descriptions and explanations provided in the MP as well as in document #2, it might be inferred that the gear and fishing method used in Manfredonia is similar to the one in GSA 9. However, STECF reiterates its observation (STECF PLEN-21-01) that the catch rates (CPUEs) of boat seiners in GSA 9 are much lower than those presented in Table 6.6.2. For example, in Tuscany, mean annual CPUEs for the period 1991-2020 ranged from 9.9 to 35.3 kg/vessel/day with an average of 20.3 kg/vessel/day (see ToR 6.10 in STECF PLEN-21-01). In order to fully understand the reasons for these differences and distinguish between natural and technical factors affecting catch rates, STECF still considers that information regarding the current gear and its use in the Manfredonia Gulf shall be updated and detailed. Additional evidences such as images and videos recorded during the fishing operations would be highly useful.

STECF notes that the origin of bycatch data included in the revised version of the plan is unclear (onboard sampling vs logbooks) and somehow contradictory with what was provided to PLEN 21-01, when the MP stated that the transparent goby fishery in Manfredonia is free of bycatch. STECF also notes that the simple tabulation of bycatch

quantities in tables, without analysis of these data, is not very useful for obtaining a comprehensive picture of bycatches and discards in the fishery. It would thus be useful to add summary tables in the documents.

Furthermore, in the tables of the new Annex III (see above) bycatch quantities refer to only five species. However, in other boat-seine MPs targeting transparent goby in the Mediterranean Sea (examined by STECF PLEN 21-01 [Liguria, Tuscany, Catalonia], STECF PLEN-19-03 [Balearic Islands] and STECF 16-15 [Murcia]) the reported bycatches were highly diverse, consisting of numerous species of coastal fish (e.g., sparids, labrids, mullids etc) and cephalopods. STECF therefore notes that reported bycatches in Annex III might not include all species caught by the boat seine fishery in Manfredonia Gulf. Finally, the size compositions of bycatches and discards are not presented, particularly with regard to species mentioned in Annex IX of Regulation (EU) 2019/1241.

STECF reiterates thus that all catches should be properly monitored, including size compositions and discards.

STECF conclusions

STECF considers that the revised management plan is significantly improved compared to the March and July versions. It sets a more precautionary CPUE trigger (at the 35-percentile of the most recent time series of daily CPUEs), as well as it defines and specifies, in a quantitative manner, the remedial actions to be taken once the average CPUE falls below the trigger.

STECF concludes that the new measures introduced in the MP (reducing the number of authorized vessels to 60 and imposing an upper limit to the number of days-at-sea per fishing season) are more restrictive than in the previous plan, although the ceiling imposed to the days-at-sea (600) still allows for an increase of fishing effort (theoretically up to two times) in relation to the number of fishing days realized in the period 2018-2020 by the authorized fleet (approximately 300).

STECF emphasizes that all data foreseen to be collected under the MP (catch of all species, size compositions, discards and socioeconomic data) should be clearly described (e.g., the design of the monitoring including the onboard sampling), and the data should be consistently collected, analysed and reported in order to adequately monitor the effectiveness of the management plan.

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

7.1 Update on indicators for marketing standards (follow-up EWG 20-05)

STECF observations

DG MARE provided an update on the actions taken as a follow up to the EWG 20-05 report on sustainability indicators for marketing standards. Currently work is under way on operationalising several indicators. Results are expected to be ready before the PLEN 22-01 meeting foreseen for March 2022.

STECF conclusion

STECF concludes that, in order to address issues that may surface during the operationalisation and testing of sustainability indicators for Fisheries and Aquaculture Products, a dedicated EWG may be provisionally scheduled for 2022, the ToRs of which could be discussed during the PLEN 22-01 plenary after presentation of the outcomes of the current activities. Additional ad-hoc workstreams may also be called for in case further comprehensive data analyses would become required.

7.2 Preparatory discussion on the implementation of the landing obligation

Background provided by the Commission

Intense collaboration and exchanges have taken place during the phasing in of the landing obligation (2015 – 2019 and beyond) between Member States, fishers, NGOs, scientists, the European Parliament and the Commission, which helped to reach get a better understanding of the implementation of the landing obligation and its challenges. This is particularly noticeable in the collaboration on what causes some discards or choke situations and the tools to be used to address these cases.

On the basis of various previous discussions within the STECF (EWGs, PLEN, ad hoc) on the landing obligation, as well as established research (projects) such as DiscardLess, and Minouw, is requested to discuss the below elements for further preparation of 2022 and to explore if and in what way the requested information can be established, also in light of the preparatory work of the 2022 report on the functioning of the CFP:

1. **Time-series discard rates**

One of the conclusions of the STECF 16-13, the monitoring of the spatio/temporal pattern of fishing activities, if combined with an appropriate knowledge of fish population (resource) distribution (in particular the components of critical life stages that generally form a large portion of unwanted catches), is expected to be useful for assessing the progressive implementation of the LO. Clearly, the application of spatial methods for assessing the implementation of the landing obligation through changes in fishing activity implies the availability of spatial data on fleet activity and fish distributions. As discussed, this is increasingly becoming available through new technologies but is, for the present not available for all fishing vessels. Over the course of next few years, coverage will likely increase but in some areas, such as the Mediterranean, progress is likely to be slower.

STECF is requested to discuss or give advice if the above assessment can be carried out or if coverage is still not to the level for such an assessment; and

Linked to the below information, *the STECF is requested to discuss the possibility to create a time-series of discard rates for the most important commercial species in the various sea-basins, and if so – on which database – FDI - and methodology and how much time this would have to take (ad-hoc contract or within a specific EWG).*

In STECF ad-hoc contract No. 2003, assessed in STECF 20-01, with the evaluation of the Member States' annual reports on the landing obligation, the STECF was requested to include the available quantitative data in the evaluation, for example within the ICES advice. STECF concluded that the scientific information has become more complex to collect, to use and to quality-check, and to explain to clients in a simple and transparent manner. ICES has highlighted that this has introduced uncertainty into their management advice, particularly given widespread discrepancies in the level of unwanted catch recorded in logbooks compared to the levels observed by at-sea observers. Examples from the ICES advice from 2019 for 2020 illustrating the extent of the discrepancies in reported and observed data were given in the ad-hoc contract. For example, the ICES advice for 2020 for plaice in the North Sea and Skagerrak highlights discrepancies between reported unwanted catches and observed discards from sampling programmes

Attempts have been carried out to analyse discard rates (trends), also in the recently published CINEA study on the landing obligation, using the FDI database and establishing a more analytical approach For this purpose the contractors of the study developed tools and methods for cleaning filtering and displaying discard information in the STECF Fisheries Dependent Information (FDI) database. This included an interactive app (ShinyApp) on overall trends in discard patterns. The study concludes that the discard rates did not show clear trends or patterns as a result of the full implementation of the landing obligation.

2. Socio economic impact

In STECF 20-01, STECF observes that several years after the start of the implementation of the LO Member States report no, or only limited, adverse socio-economic impacts, mainly due to the exemptions in place. The only impacts reported by Member States are whether fishing companies were able to sell undersized fish (not allowed under the CFP). Other Member States still flag the problems of handling undersized fish and STECF notes that this may be one reason why member States Regional Groups have increasingly asked for de minimis derogations regarding disproportionate costs for handling the small portions of undersized fish in a large catch.

One conclusion of STECF 16-13 on the socio-economic indicators of the landing obligation, that some of the more detailed evidence that is not already collected may be costly to collect, collate and analyse, and therefore those wishing to know or understand the impacts of implementing the LO will have to consider the value of detailed evidence compared to the cost of producing it. By including suggestions in this report, there is no implied suggestion that these metrics would be "worth the cost" of collecting and analysing the data required.

Within the ad-hoc contract No 2003 in 2020, STECF concludes when evaluating the reports we received from the Member States 'Most Member States report that it remains difficult to assess the socio-economic impacts of the landing obligation, indicating that problems remain minimal across sea basins. For 2019, very limited information was supplied, and anything provided merely repeated the same information provided in 2017 and 2018. However, extensive modelling of the impacts of the landing obligation were provided in the H2020 funded DISCARDLESS and MINOUW projects. The general conclusion was that while there were initial short-term economic impacts, in the longer-term these were more positive.'

However, stakeholders voice concern about the socio-economic impact of the landing obligation. For example, in its European Parliament initiative report – the European Parliament calls on the Commission to include in the 2022 report on the functioning of the CFP an assessment of the socioeconomic impact of the landing obligation, the remuneration system, the number of crew members and the safety and working conditions on board, in line with FAO and ILO recommendations.

The STECF is requested to discuss this topic and advice the Commission in what way further steps (if any) can be made in preparation for 2022 to assess the socio-economic impact.

3. Review of exemptions to the landing obligation in place (high survivability and de minimis)

STECF 21-05, evaluating the joint recommendations on the (exemptions of the) landing obligation, concluded that it would be timely for the Member States Groups and the Commission to review exemptions that have been in place since the introduction of the Landing Obligation. This review would help to determine whether they need to remain or are could be lifted given likely changes in catch patterns, gears used, vessels involved and uptake of selectivity measures.

STECF is requested to discuss the proceedings of such a review – what preparatory work should be carried out to facilitate such a review, and the possibility to be included in one of the EWGs in 2022.

4. Next year evaluation of Member States Report of implementation of the landing obligation

STECF is requested to shortly discuss the annual exercise of evaluating the Member States Reports of the implementation of the landing obligation (latest STECF PLEN 20-01), to explore already if any STECF member is available for an ad-hoc contract.

As identified by STECF PLEN 19-01, and 20-01, feedback on the progress at sea basin level is critical to understanding how effective the implementation of the landing obligation has been and what adjustments are necessary. It is evident from the 2019 reports that there has still been no cooperation between Member States at sea basin level in completing the questionnaire. A coordinated approach to reporting at the regional level would help to avoid the large amount of repetition that continues to appear in the submitted questionnaires. The Commission aims to receive such coordinated approach in 2022 by the different Member States Regional Groups.

Background

In line with Article 15(14) of the Regulation on the Common Fisheries Policy (CFP), the Commission reports annually on the implementation of the landing obligation of the year prior to the report based on information transmitted by the Member States, the Advisory Councils and other relevant sources to the Commission. This reporting is included since 2016 in the Commission's annual Communication submitted every June on the State of Play of the Common Fisheries Policy and Consultation on the Fishing Opportunities. The Commission's Communication in 2021 will cover the implementation of the landing obligation in 2020.

The legal obligation of the Commission to annually report on the implementation of the landing obligation is finished, as it was up to 2020. However, as the landing obligation is a key element in the CFP to contribute to its objectives of sustainable fisheries, it was decided to continue its annual exercise.

In order to facilitate the reporting, and in line with the outcome of STECF EWG 16-04, in 2017 Member States were invited on a voluntary basis to complete questionnaires seeking more detailed information on the impact of the landing obligation and national steps taken to assist with its implementation. In 2018 and 2019, Member States were asked to update the information provided as appropriate with additional questions on control and enforcement. The questionnaire continues to help structure the responses provided by the Member States and the quality of information provided has improved. The questionnaire follows a similar approach each year to ensure comparability of replies. Still, where relevant, questions are updated in view of the available scientific advice and STECF 20-03 recommendations. Previous included questions on the expenditure of the European Maritime and Fisheries Fund are deleted because the Commission will carry out a separate analysis on this matter. We have also included several format tables to assist Member States in providing quantitative information on unwanted catches and catches discarded under exemptions.

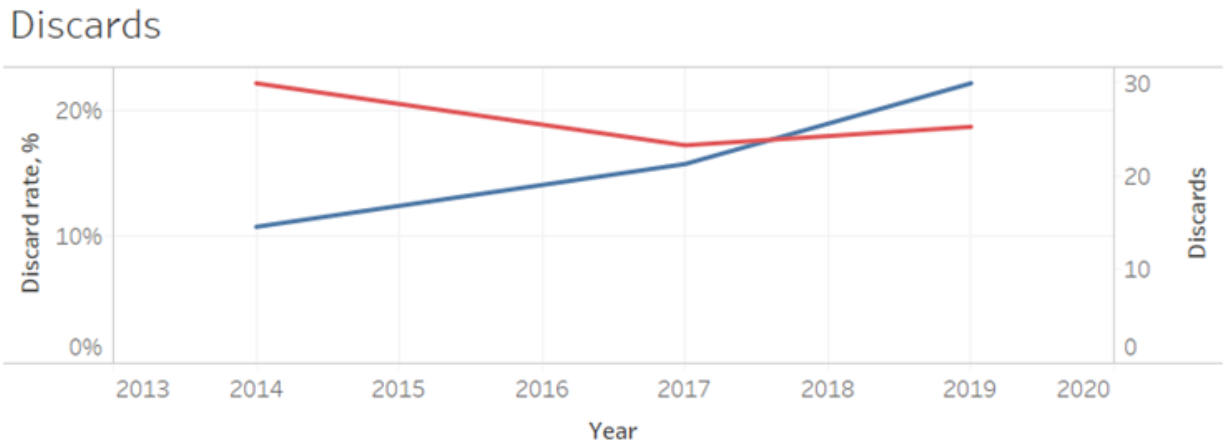
STECF comments

1. Time-series discard rates

STECF is requested to discuss or give advice if a spatial assessment of the implementation of the landing obligation through changes in fishing activity can be carried out or if coverage is still not to the level for such an assessment

STECF notes that in the FDI database, there is a link between Table H (Landings by rectangle) and Table A (catch summary) through year, quarter, country, vessel length, fishing technique, gear specifications, metier and species. However, these tables do not provide discards by statistical rectangle or spatial information relating to implementation of the landing obligation. Currently, discard rates at the level of statistical rectangles are only available from Fully Documented Fisheries (FDF) trials.

The FDI spatial/geographical data covers landings (weight and value) and effort (fishing days) over several years, and this allows showing where fleets have been operating and how their spatial activities have changed over the time. This provides some, albeit limited, insight into the implementation of the landing obligation as it will highlight changes in fishing activities and possible avoidance of certain areas. The rectangles are filled in with landings weight data and represent spatial maps of activity related to specific metiers. By layering all maps for 2015-2020, possible evolutions in spatial fishing patterns can be described. It should technically be possible to visualise this by filtering the FDI data to provide, for example, interactive views with indicative discard rates by species and metier as well as the geographical distribution of the landings related to the same metiers on one interactive dashboard. The types of output that could be generated is illustrated in figure 7.2.1.



STECF notes, however, this type of exercise will only provide a visualisation of the FDI data and show the spatial evolution of fleet activity. It also requires a high degree of knowledge of the FDI data and additional data quality checks making sure data coming from the different FDI data tables is consistent. Therefore, as a first step, STECF proposes to conduct a small pilot feasibility analysis using FDI data driven case studies (e.g., for specific species and or fishing gears/metiers). Results of the pilot analysis will inform on the usefulness of FDI data for the purpose identified by the Commission and what tools and resources could be used to complete a more comprehensive picture in the future for more species and metiers.

STECF is requested to discuss the possibility to create a time-series of discard rates for the most important commercial species in the various sea-basins, and if so – on which database – FDI - and methodology and how much time this would have to take (ad-hoc contract or within a specific EWG).

STECF considers that it should be possible to create such a time-series of discard rates by metier and species, for those where information exist. STECF would suggest perhaps using the species listed in Annex XIV of the Technical Measures Regulation (Regulation (EU) 2019/1241) as the basis for this time-series.

STECF notes the analysis of discard rates for the period 2015 to 2019 carried out in in the recently published CINEA study on the landing obligation (European Commission, 2021). In this project, tools and methods for cleaning, filtering and displaying discard information contained in FDI database were developed. Further an interactive app (ShinyApp) allowing easy interrogation of discard rates from the FDI data in a dynamic way. This app tool has the potential to allow updated information on discards, including discard rates and assist in the establishment of a time-series of discard rates. STECF concludes that updating the analysis completed in the CINEA study is possible. However, STECF is aware that while the app was indeed designed to be updatable, a substantial degree of collating and cleaning of data will always be needed before any updating. Furthermore, the data used in the CINEA study were raw data provided in the FDI data call by the MS to the Commission, not the aggregated and publicly available data processed by the FDI EWG. So the use of the data at dis-aggregated level is restricted and requires permission from the Member States. STECF Bureau should further discuss this with MARE and establish whether and how the experts familiar with the app could be further involved to develop the time series.

STECF also highlights the analysis carried out in STECF EWG 13-23 of the differences in discard data from ICES and from the FDI database for 85 stocks. This analysis compiled an interesting and valuable spreadsheet comparing the time series of catch data from 2009

to 2012 held by ICES and STECF, which indicated that discrepancies between the two data sources had decreased over time. The analysis also identified which data were the most appropriate to use for discard estimates and also provided a categorisation of the discard data available as well as commenting on the quality and reliability of the discard data for the 85 stocks considered. STECF observes it may be useful for DGMARE to re-visit this analysis and consider whether it would be opportune to repeat the exercise.

However, STECF cautions, as acknowledged by the authors, that the CINEA study has not evidenced any clear trends or patterns up to 2019 because of the landing obligation due to limited implementation of the landing obligation to date. Therefore, STECF agrees with the conclusions of the study that there is a lack of evidence of changes in discarding practice in the fisheries and that discarding is still taking place despite the landing obligation.

In this regards, STECF notes that the analyses of time series of catch-at-age performed by EWGs 20-02 and 21-07, albeit not separated between landings and discards, may also provide additional useful evidence on whether any changes in selectivity may have occur since the implementation of the landing obligation.

2. Socio economic impact

STECF is requested to discuss this topic and advice the Commission in what way further steps (if any) can be made in preparation for 2022 to assess the socio-economic impact.

STECF comments

STECF notes that as mentioned in the background STECF looked at possible socio-economic impacts of the LO. However, the answers in the questionnaires on the LO included very little or no information on impacts. Also, from the yearly data collection (e.g. AER or FDI data) no conclusions could be drawn on the socio-economic impacts of the LO. This is coherent with the findings above from the CINEA study that there are no clear trends in discard rates. All these studies concur to evidence that, at least until 2019 where all data are available, there is a lack of evidence of changes in discarding practice in the fisheries, and as such this does not translate in any changes in the economic indicators.

STECF notes that during the plenary meeting it was discussed with DG MARE how STECF may be able to, for example, provide some updated literature review of reports and publications of the socioeconomic impacts of the LO, as well as providing a comprehensive overview on model-based conclusions from different scenarios and fisheries of implementing the LO. This sort of information may be helpful for DG MARE to draft the report on the functioning of the CFP especially regarding Art. 15 of the CFP Regulation. That review could be performed through an ad-hoc contract, and later summarised and included in the next EWG dealing with the landing obligation through a specific ToR for this group.

Nevertheless, STECF underlines that most scientific publications related to the modeling of the potential socioeconomic impact of the landing obligation contrast status quo ("Business As usual") scenarios against a range of implementation scenarios ("what if") (cf synthesis review in Hoff et al., 2019). Under "Business As usual" scenarios, the rates of unwanted catches and discards are assumed unchanged. In the other hand, the "what if" scenarios depict theoretical situations where the landing obligation is fully enforced with full compliance including choke species effects. Such scenarios would typically assume that the rates of unwanted catches and discards are quickly reduced to zero. There are also scenarios that try to mimick the provisions and derogations of the Art. 15 of the CFP, again assuming that these are fully enforced. Considering the lack of evidence of true changes

in fisheries following implementation of the landing obligation, STECF considers that these calculated potential impacts do not really reflect the real situation.

If DG Mare requires a more in-depth analysis of the real situation and of any true social, cultural and economic change that the landing obligation may have induced in the fisheries and in the fishers' perception, STECF notes that some scientific literature also exist on the subject, largely coming from the same research projects as mentioned above, though involving social science analyses and not bio-economic models. This literature could also be summarised through an ad-hoc contract, possibly together with the modelling literature review mentioned above. However, an additional dedicated data collection exercise including social science methods (especially semi-structured interviews) in the MS would also be necessary to supplement a review of existing information. Detailed discussions with individual fishers and targeted analysis of disaggregated data in selected case studies could evidence some changes at a scale smaller than can be captured by global statistics and standard aggregated data, for example if new gears are being used.

STECF concludes nevertheless that this suggestion is comprehensive and results might not be available in the near future. A dedicated study is needed, involving also the RCGs and experts involved in the collection of social data.

3. Review of exemptions to the landing obligation in place (high survivability and de minimis)

STECF is requested to discuss the proceedings of such a review – what preparatory work should be carried out to facilitate such a review, and the possibility to be included in one of the EWGs in 2022.

STECF EWGs 19-08, 20-04 and 21-05, that evaluated the joint recommendations on the (exemptions of the) landing obligation, concluded that it would be timely for the Member States Groups and the Commission to review exemptions that have been in place since the introduction of the Landing Obligation. STECF notes there are more than 100 de minimis and survivability exemptions in place across the different EU sea basins. While some of these exemptions are time limited or have specific annual reporting requirements, there are others which have been in place for a considerable amount of time with no recent assessment.

STECF observes that a review would help determine whether all the existing exemptions are still required, are being used and whether discards under these exemptions are being reported on. This review will also establish whether exemptions can be removed or amended to reflect uptake of the exemption, changes in catch patterns, gears used, vessels involved and uptake of associated selectivity measures. This is particularly the case for exemptions included under the pelagic discards plans for the NWW, SWW and North Sea, which came into force in 2015 and were renewed in 2020 until the end of 2023. The exemptions included under these plans have not been subject to any further assessment by STECF since 2014 (STECF PLEN 14-02). There are other exemptions relating back to the demersal discard plans of 2016-2018 that similarly have not been considered since the original STECF evaluations in the 2014-2016 assessments.

STECF suggests four steps to completing such a review:

Step 1: To catalogue all the exemptions by region and identify the relevant exemptions that have not been reviewed since 2016 and are not subject to any specific reporting requirements (e.g., additional scientific information supporting the exemptions, in terms of discards and further research in the relevant fisheries) beyond the standard requirement of the control regulation to report catches. STECF notes that a large part of this has already been compiled in the CINEA study and that only a limited update of this would be required, which can be performed through a short ad hoc contract or by MARE internally.

Region	Exemption	Relevant Delegated Act	Last STECF evaluation	Time limited	Specific Reporting Requirements	Review required
NWW	*Survivability of mackerel in purse seines*	*Commission Delegated Regulation (EU) 2020/2015*	*STECF PLEN 14-02*	*No*	*No*	*Yes*

Step 2: To discuss the list of identified exemptions for review with the Member States regional Groups and establish which exemptions, if any, can be removed from the relevant Delegated Act and others that Member States still require.

Step 3: To develop a template for Member States to provide the necessary information to allow STECF to carry out a review of the relevant exemptions. This could also be carried out through an ad hoc contract as part of Step 1. The types of information needed include:

- Uptake of exemption (number of vessels by gear type)
- Level of discards under the exemption
- Changes in catch patterns
- Uptake of any associated selectivity measures
- Specific control and monitoring measures put in place

Step 4: STECF to review these exemptions. Depending on the number of exemptions identified this could be done at the annual STECF EWG to evaluate the Member States Joint Recommendations. This would also depend on the number of new or exemptions with reporting requirements that this EWG is likely to have to assess in 2022. Alternatively, the review could be carried out through a specific ad hoc contract and then reviewed by STECF at plenary.

4. Next year evaluation of Member States Report of implementation of the landing obligation

STECF is requested to shortly discuss the annual exercise of evaluating the Member States Reports of the implementation of the landing obligation (latest STECF PLEN 20-01), to explore already if any STECF member is available for an ad-hoc contract.

STECF has noted in the past (PLEN 18-02, PLEN 19-02, PLEN 21-02) that the Member States while providing significant information and data in certain areas (e.g. pilot studies; number of infringement; discard quantities under exemptions) the reports still constitute mostly qualitative information and considerably repetition between years. Additionally, little or no information has been provided by the Advisory Councils in the last few years and has been restricted to communications on specific issues of most concern to them.

STECF concurs with DGMARE that a coordinated approach to reporting at the regional level would help to avoid the large amount of repetition that continues to appear in the submitted questionnaires. This would simplify the review process and may also allow various sources of sampling to be collated at the regional level, to provide a more complete picture of the effectiveness of the Landing Obligation at the regional level.

STECF will discuss the best approach to carry out the analysis of the Member States reports at the STECF bureau meeting in December.

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7.3 Organisation of next year's Expert Working Group on Technical Measures

Background provided by the Commission and request to the STECF

Regulation (EU) 1241/201916 introduced the obligation for the Commission to report to the European Parliament and to the Council on the implementation of the Regulation, assessing the "*extent to which technical measures both at regional and Union level have contributed to achieving the objectives set out in Article 3 and reaching the targets set out in Article 4*." (Article 31.1)

Measuring progress in achieving the objectives set out in Article 3 and in reaching the targets set out in Article 4 is vital to check whether technical measures put in place are adequate and fit for purpose, and consequently, to assess where and how changes should be made.

Future decisions on technical measures to be taken at regional level, specifically to monitor progress over time and should consider tools, or indicators, to be requested to scientific bodies, which will deliver them for a number of key indicator stocks (namely, for the species included in the Annex XIV of the Regulation), and should take into consideration the particularity of mixed fisheries and recruitment spikes.

A vital part of the Commission's report is the assessment of the contribution of the technical measures in optimising exploitation patters and the progress made. It is necessary to assess whether there are any changes in selectivity and whether these changes are showing improvement towards optimum selectivity patterns that will offer the highest yield possible.

Given that Regulation does not set legally binding targets though, during 2020, a dedicated STECF EWG (STECF EWG 20-02) was tasked to evaluate the performance of technical measures in line with the above and provide the most adequate indicator that can be used routinely to carry out the evaluation required by the regulation. This expert group also provided valuable input regarding the current situation of sensitive species and habitats.

The outcomes of this group helped the Commission to prepare *the first report on the implementation of technical measures***17** adopted in September 2021 (attached as background).

As a complement to this report, in Spring 2022 will be presented an *Action plan setting out recommendations to Member States* concerning measures to redress the issues identified in the Report on the Implementation of the Technical Measures Regulation and in the accompanying Staff Working Document.

Following the STECF EWG 20-02, and given that STECF will be requested to undertake an evaluation of the performance of the technical measures every three years hereby

16 Regulation (EU) 2019/1241 of the European Parliament and of the Council of 20 June 2019 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures.

17https://ec.europa.eu/oceans-and-fisheries/news/sustainable-fisheries-commission-publishes-first-report-implementation-technical-measures_en

advising the Commission in two years' time on their triannual reporting obligation, some considerations on how to proceed in the future were provided and discussed during STECF PLEN 21-01 and STECF 21-02.

STECF 21-01 observed that there *is still margin to test and refine different indicators* which will provide information on temporal changes in selectivity, needed to carry out these assessments as well as identifying the data and information that would be required.

In order for the STECF to provide relevant advice for the Commission, a stepwise approach was suggested and followed within the STECF EWG 21-07.

It is important to take into account in the upcoming work on this matter that optimisation needs to be seen from a wide array of perspectives and not only from a biological perspective. Considerations on the possible trade-offs and the implication of environmental, social and economic factors will also need to be taken on board for future assessments, *in particular when envisaging future managing measures to tackle the progress in achieving optimum selectivity parameters (biological and economic).*

STECF-21-07 has analysed growth and selectivity for various commercial fish species in order to evaluate possibilities for increasing long-term yields through technical measures. The results of that exercise are expressed in terms of age at first capture. In order to implement such results in various fishing sectors it is necessary to translate these results into descriptors of fishing gears, notably for mesh sizes. While the adaptation of fishing gears to change selectivity is a complex issue, a documentation of these relationships is an essential first step towards implementation.

Another issue is that altering the selectivity of fishing gears will cause short-term losses in catch which will only gradually be recovered through the growth of subsequent cohorts of fish. Stepwise implementation of selectivity improvements is likely to be appropriate in order to avoid short-term economic shocks.

Request to the STECF

The STECF is requested to propose organization of future works, considering the conclusions of EWG 21-07, the work already carried out by EWG 20-05, the findings of the first report of the implementation of the TMR and the recommendations to be included in the future Action Plan as a result of the preliminary findings of the first implementation report.

STECF is requested to discuss as to the feasibility of the ToR below for 2022, in respect of developing further the work on selectivity:

(1) For the principal commercial fisheries in European waters for which adequate data are available:

   a. Identify the principal fishing gears in use (e.g. otter trawl, beam trawl, trammel net, gill net etc.)

   b. For each gear type and each species, map the relationship between the size of the smallest mesh used in the fishing gear and the age at first capture, assuming other characteristics of the fishing gear remain unchanged. Here, "mesh" should be interpreted broadly to include parameters such as bar spacing or ring size in dredges.

c. This work can be based on published studies and the use of appropriate models.

(2) For each of the fish stocks assessed in STECF EWG 21-07, calculate 20-year trajectories of likely future catches under scenarios of transition from current selectivity to optimum selectivity, based on either:

a. A single transition step to be implemented on 1 January 2023

b. Two equally-spaced transition steps at two-year intervals beginning on 1 January 2023

c. Three equally-spaced transition steps at two-year intervals beginning on 1 January 2023

d. Four equally-spaced transition steps at two-year intervals beginning on 1 January 2023

e. Any other scenarios considered suitable at the discretion of STECF.

STECF response

STECF discussed, while consulting with representatives of DGMARE, the recommendations from the executive summary of EWG 21-07, the proposed ToRs above and a new ToR the representatives of DGMARE proposed during the plenary meeting. Especially the feasibility of the proposed ToRs was discussed, with respect to data availability, time resources and scientific soundness.

STECF concludes that more time is needed to explore the feasibility of proposed ToRs. Since the EWG 2022 will probably be held in October, there is still time for further consultations between STECF and DGMARE before the final ToRs for the EWG 2022 need to be formulated. It should also be noted that there will be another EWG in 2023 before the next evaluation by the Commission of the Technical Measures Regulation is due in December 2023, so the work can be spread over two EWG meetings.

7.4 Preparation of the 2022 FDI data call

Background information and request to the STECF provided by the Commission

As of the exit of the UK from the Union, the UK is no longer bound by the CFP. The UK had at the beginning of 2021, integrated most of the Union legislation in their legal framework. However, this will be progressively adapted.

Although the Union and the UK maintain a straight fisheries management relationship, there is potential for the EU and the UK to implement different policies across border. An example is that of the LO exemptions available in UK waters and in the EU waters for 2021, about which some differences can be found for 2021, or, as well, in the technical measures implemented by the UK in the Celtic Sea as of October 2021, which deviates from what the Union has in place.

Different measures in place require that the data available to support policy decision cater for these differences. For example, when an EU LO exemption is applicable in Union waters only, a proper apportioning of catch and discard data, relative to Union waters, has to be subset to allow a more precise estimation of the fishing volumes involved. The same as regarding technical measures, where for example, changes of gear selectivity and of the conditions that trigger a certain gear to be used, will have practical results in catch compositions, and have therefore to be possible of differentiation. Potentially the differences that before UK exit were non-existent, now, because of the new geography, may result in differences in the activity at several levels.

In conclusion, this new geography brings about additional challenges that can only be fully assessed only if data available are fit for that purpose, commercial and scientific data. Currently the FDI database does not allow for this additional partition of the data between EU and UK jurisdictions. In addition, FDI tables have diverse levels of geographic information (ICES sub-area, statistical rectangles, etc.) and several procedures require the FDI Tables to be consistently merged to allow proper relationship between biological and catch data.

Request to the STECF

The STECF is requested to:

1. Discuss the possible ways forward to address the new challenges this represents to the FDI data call/database;
2. Identify potentially other topics not hereby identified, as for example related with biological data collection and provision;
3. Advice on a sound approach to ensure that FDI in the future will encompass all necessary data, with the needed level of disaggregation, to allow addressing

current and possible new management requests. Preferably, the 2022 FDI data call will already be adjusted to request data on a finer level of granularity.

STECF comments

Brexit and UK issues related to the FDI

STECF notes that the FDI data call already incorporates the possibility to provide different geographical areas apart from the EU EEZ through the EEZ_INDICATOR. The only amendment needed to the FDI data call is a new code for UK waters and update of the Appendix 9 of the data call. Such changes will allow the partitioning of data between the UK and EU jurisdictions.

Although STECF is aware of the extra work needed by Member States to split the data, the different juristically legislations between the EU and UK may facilitate the correct provision of the data, since the vessels operating in UK waters will have a UK issued licence with a different regulation and other control measures applied. STECF notes however that not only catches (landings and discards) and effort need to be split up, but also the value of the landings. Furthermore, additional assumptions will need to be made to derive estimates of the value of the landings from the UK and EU EEZs. STECF notes that the assumptions made will influence the accuracy and precision of the estimates provided and that such estimates will most likely have an influence on the allocation of fishing opportunities (possible misallocation of catches).

STECF notes that there is a risk of deterioration of the reported data for the exemptions to the landing obligation, due to further splitting of sampling data between EU and UK waters. The adequacy between the reporting / sampling needs for the exemptions and the national and regional workplans in the EUMAP will thus have to be re-considered. STECF notes that currently the EUMAP geographical stratification does not separate between waters as it all collected for ICES zones.

However, it is also unclear whether EU fleets will change gears and fishing patterns when entering the UK waters, or whether changes might apply to specific selectivity device. These specific selectivity devices are currently not always properly reported in the logbooks. STECF is aware that a change to the logbook system is needed to incorporate all selective devices in the future to improve the LO monitoring.

STECF suggest that the FDI data call request, e.g., for all rectangles/ICES areas that have a borderline between EU and UK (in data sets) to make the EEZ indicator as obligatory for the bordering areas (MS are not allowed to put NK or NA, but always have to add EU/UK waters). STECF also suggest that this quality check is implemented during the upload through JRC.

Other required improvements of the data currently reported to the FDI

STECF notes that the FDI database is not only one of the most comprehensive fishery databases with landings, discards, effort and biological information from all areas where the EU fleets operate, it also provides linkages between biological, transversal and economic data. However, since the 2020 FDI data call, no biological data were requested from the Mediterranean and Black Seas. STECF believes that a re-introduction of such data would make the FDI database more valuable in the future. The EWG 21-10/21-12

considered that the STREAM regional project[18] deeply analysed the standard formats of the data calls. The project developed auxiliary scripts for the conversion of datasets into the relevant formats for the data transmission (project deliverable 3.2), and proposed that the last unresolved issues be finally addressed through ad-hoc contracts in 2022 (see ToR 5.4 of this PLEN 21-03 report). STECF underlines the importance of finally solving this question in 2022 to ensure the full coverage of all EU fisheries in the FDI.

STECF notes that currently the FDI incorporates only a limited number of specific gear conditions/gear configurations (e.g., Bacoma, T90, GRID19, GRID35, SELTRA, SEPNED, etc.). However, STECF is aware that the number of specific gear conditions/gear configurations under exemptions to the landing obligation and derogations to the Technical Measures Regulation has increased, and will likely continue to do so in the future. Therefore, STECF suggests that Member States improve the reporting of all specific gear conditions in use to the extent possible and the FDI data call amended to include appropriate codes for these gears. However, STECF understands that the reporting of these specific gear devices is not routinely reported across Member States through logbooks currently and this may require changes to the logbook system to allow fishermen to enter this information using the relevant codes easily.

STECF notes though that it is clear that the conditions and complexity of some exemptions will never be captured within the FDI data call definitions, for example when the exemption specifies a specific area (54 degrees north), tow duration (90 minutes), etc. Therefore discard estimates for such exemptions will remain unprecise.

STECF notes that sampling by Member State is primarily designed for stock assessment and global management advice (TAC/effort), and not always suitable for small exemptions to the landing obligation. Therefore, exemption-specific coverage for biological sampling is usually poor by design and proportions of the catch above and below MCRS are poorly estimated. STECF notes that as this additional data collection may well go beyond the DCF/EU-MAP requirements and that specific data needs such as these, should be collected in target sampling on the national or regional level.

STECF also encourage clarifications on the data call definitions as well as providing further specifications to the Member States (cf ToR 5.4 of this plenary report).

Possible future needs for the FDI data call

STECF suggests that future FDI data calls could call for fuel consumption data. Such data are currently called as part of the fleet economic data call and available at a fishing fleet level. However, a finer resolution of FDI and link to geographical data might be informative for both scientists and managers. STECF also notes that emission issues are high on the political agenda (European Green Deal and the Fit for 55 packages) and could be informed by linking fuel information with the effort tables.

18 Project results are available at: https://datacollection.jrc.ec.europa.eu/mare-2016-22-strengthening-regional-cooperation

STECF conclusions

STECF concludes that the FDI data call already incorporates the possibility to report data by geographical areas (EEZs) through the EEZ_INDICATOR. The only amendment needed to the FDI data call is a new code for the UK waters. However, STECF notes that this data split will not only require extra work from the Member States, but also extra assumptions to derive estimates of the value of the landings from the UK and EU EEZs respectively.

STECF suggests to make the EEZ indicator as obligatory in the FDI data call request for all rectangles/ICES areas that have a borderline between EU and UK (in data sets) (MS are not allowed to put NK or NA, but always have to add EU/UK waters). STECF also suggests that this quality check is implemented during the upload through JRC.

In anticipation for addressing current and possible new management requests in the future, STECF concludes that the following changes in the FDI would be needed:

1) The solving of the re-introduction of biological data from the Mediterranean and Black Seas into the FDI database
2) An updated and more comprehensive list of all currently regulated selective gears.
3) The inclusion of fuel consumption data

STECF concludes that where the EU-MAP data collection by MS is not sufficient to fully inform on e.g. exemptions to the landing obligation, additional targeted sampling might be required to be undertaken nationally or regionally.

References

European Green Deal has set targets and ambitions on becoming climate-neutral by 2050, protect human life, animals and plants by cutting pollution; help companies become world leaders in clean products and technologies; and help ensure a just and inclusive transition

Fit for 55 refers to **the at least 55% emission reduction target which the EU has set for 2030**. The proposed package aims to bring the EU's climate and energy legislation in line with the 2030 goal.

Steam project results are available at: https://datacollection.jrc.ec.europa.eu/mare-2016-22-strengthening-regional-cooperation

8. 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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9. ANNEXES

Annex table for section 6.5.

country_code	EMU	sub_region	gear_type	vessel_length	effort	2015	2016	2017	2018	2019	2020
ESP	1	1	DRB	<12m	fishing days	5838	5314	4380	3890	5170	6082
ESP	1	1	DRB	>=12 and <18m	fishing days	30	21	7	7	14	51
ESP	1	1	DRB	>=18 and <24m	fishing days	2	18	0	0	0	0
ESP	1	1	FPO	<12m	fishing days	9087	6789	8296	12755	11360	10662
ESP	1	1	FPO	>=12 and <18m	fishing days	346	685	733	780	685	575
ESP	1	1	FPO	>=18 and <24m	fishing days	0	0	7	21	0	0
ESP	1	1	FPO	>24m	fishing days	0	0	4	0	0	1
ESP	1	1	GND	<12m	fishing days	0	0	2	0	0	0
ESP	1	1	GNS	<12m	fishing days	4657	3728	2458	1232	1151	1667
ESP	1	1	GNS	>=12 and <18m	fishing days	117	79	68	50	71	91
ESP	1	1	GNS	>=18 and <24m	fishing days	0	0	0	0	0	1
ESP	1	1	GTN	<12m	fishing days	2	1	0	3	0	2
ESP	1	1	GTN	>=12 and <18m	fishing days	76	149	152	54	101	50
ESP	1	1	GTR	<12m	fishing days	8045	8524	7941	9195	10068	9221
ESP	1	1	GTR	>=12 and <18m	fishing days	270	481	546	751	888	784
ESP	1	1	GTR	>=18 and <24m	fishing days	0	0	0	0	0	1
ESP	1	1	HMD	>=12 and <18m	fishing days	0	0	0	28	0	0
ESP	1	1	LA	>=12 and <18m	fishing days	0	0	0	0	1	0
ESP	1	1	LHM	<12m	fishing days	142	29	9	0	2	0
ESP	1	1	LHM	>=12 and <18m	fishing days	16	14	8	10	1	0
ESP	1	1	LHM	>=18 and <24m	fishing days	1	3	0	0	0	0
ESP	1	1	LHP	<12m	fishing days	604	454	290	431	155	61
ESP	1	1	LHP	>=12 and <18m	fishing days	0	2	1	159	53	34
ESP	1	1	LHP	>=18 and <24m	fishing days	0	0	0	6	0	0
ESP	1	1	LHP	>24m	fishing days	0	0	0	0	1	0

ESP	1	1	LLD	<12m	fishing days	61	108	109	61	138	265
ESP	1	1	LLD	>=12 and <18m	fishing days	932	759	833	676	726	712
ESP	1	1	LLD	>=18 and <24m	fishing days	244	274	232	170	173	152
ESP	1	1	LLD	>24m	fishing days	8	30	62	10	6	14
ESP	1	1	LLS	<12m	fishing days	2198	1264	808	547	303	289
ESP	1	1	LLS	>=12 and <18m	fishing days	389	319	196	154	303	285
ESP	1	1	LLS	>=18 and <24m	fishing days	0	4	2	0	0	0
ESP	1	1	LTL	>=12 and <18m	fishing days	0	3	0	0	0	0
ESP	1	1	LTL	>=18 and <24m	fishing days	0	1	4	0	0	0
ESP	1	1	OTB	<12m	fishing days	741	713	843	656	622	491
ESP	1	1	OTB	>=12 and <18m	fishing days	6051	5834	6709	7024	7694	6215
ESP	1	1	OTB	>=18 and <24m	fishing days	9537	8064	8401	10887	11819	10275
ESP	1	1	OTB	>24m	fishing days	1322	873	1017	1830	1864	1737
ESP	1	1	OTM	>=12 and <18m	fishing days	0	0	0	0	0	0
ESP	1	1	PS	<12m	fishing days	1136	1012	1225	965	929	590
ESP	1	1	PS	>=12 and <18m	fishing days	5566	4669	5709	4345	5178	4145
ESP	1	1	PS	>=18 and <24m	fishing days	2961	2558	2907	2355	3344	2850
ESP	1	1	PS	>24m	fishing days	17	12	117	76	115	115
ESP	1	1	PTB	>=12 and <18m	fishing days	0	0	0	0	4	0
ESP	1	1	SDN	<12m	fishing days	0	1	1	0	1	0
ESP	1	1	SV	<12m	fishing days	43	172	166	420	337	332
ESP	1	5	DRB	<12m	fishing days	0	11	0	0	0	0
ESP	1	5	DRB	>=12 and <18m	fishing days	2	0	0	0	0	0
ESP	1	5	DRB	>=18 and <24m	fishing days	0	2	3	0	0	0
ESP	1	5	FPO	<12m	fishing days	56	66	52	223	576	380
ESP	1	5	FPO	>=12 and <18m	fishing days	0	7	42	11	12	133
ESP	1	5	FPO	>24m	fishing days	187	126	269	317	195	258
ESP	1	5	GNS	<12m	fishing days	3295	3211	2593	833	1088	1124

ESP	1	5	GNS	>=12 and <18m	fishing days	0	0	2	27	0	1
ESP	1	5	GTN	>=12 and <18m	fishing days	0	0	0	1	0	0
ESP	1	5	GTR	<12m	fishing days	9950	9888	10163	11466	11733	10194
ESP	1	5	GTR	>=12 and <18m	fishing days	4	1	0	0	1	0
ESP	1	5	LA	<12m	fishing days	766	1086	779	1292	1333	887
ESP	1	5	LA	>=12 and <18m	fishing days	0	0	0	0	20	0
ESP	1	5	LHM	<12m	fishing days	2	0	0	4	10	0
ESP	1	5	LHM	>=12 and <18m	fishing days	4	3	0	0	0	3
ESP	1	5	LHM	>=18 and <24m	fishing days	0	6	0	0	0	0
ESP	1	5	LHP	<12m	fishing days	633	403	505	837	878	200
ESP	1	5	LHP	>=12 and <18m	fishing days	0	0	0	0	5	4
ESP	1	5	LHP	>=18 and <24m	fishing days	3	0	0	0	0	0
ESP	1	5	LLD	<12m	fishing days	51	65	93	107	95	591
ESP	1	5	LLD	>=12 and <18m	fishing days	586	649	925	605	492	381
ESP	1	5	LLD	>=18 and <24m	fishing days	814	687	601	754	539	761
ESP	1	5	LLD	>24m	fishing days	147	74	69	138	37	101
ESP	1	5	LLS	<12m	fishing days	1875	1871	1649	1964	4799	5983
ESP	1	5	LLS	>=12 and <18m	fishing days	30	20	14	101	224	33
ESP	1	5	LLS	>=18 and <24m	fishing days	15	0	0	1	0	0
ESP	1	5	LLS	>24m	fishing days	3	0	0	0	0	0
ESP	1	5	LTL	<12m	fishing days	0	1	0	0	0	1
ESP	1	5	LTL	>=18 and <24m	fishing days	3	0	0	0	0	0
ESP	1	5	OTB	>=12 and <18m	fishing days	1242	1527	1185	949	797	773
ESP	1	5	OTB	>=18 and <24m	fishing days	9139	7556	6670	5826	5611	5051
ESP	1	5	OTB	>24m	fishing days	2395	1483	1827	1934	1794	1482
ESP	1	5	OTM	>=18 and <24m	fishing days	0	0	0	0	2	0
ESP	1	5	OTM	>24m	fishing days	0	0	0	0	1	0
ESP	1	5	OTT	>=18 and <24m	fishing days	0	2	0	0	0	0

ESP	1	5	OTT	>24m	fishing days	1	0	0	0	0	0
ESP	1	5	PS	<12m	fishing days	534	521	239	178	168	126
ESP	1	5	PS	>=12 and <18m	fishing days	401	457	532	444	381	231
ESP	1	5	PS	>=18 and <24m	fishing days	7	2	29	18	27	24
ESP	1	5	PS	>24m	fishing days	16	18	15	46	50	47
ESP	1	5	SV	<12m	fishing days	311	259	107	127	233	310
ESP	1	6	DRB	<12m	fishing days	616	218	199	335	45	80
ESP	1	6	DRB	>=12 and <18m	fishing days	148	259	190	1117	63	125
ESP	1	6	DRB	>=18 and <24m	fishing days	11	11	3	0	0	0
ESP	1	6	DRB	>24m	fishing days	1	0	0	0	0	0
ESP	1	6	FPO	<12m	fishing days	7104	6478	11001	8979	14867	10854
ESP	1	6	FPO	>=12 and <18m	fishing days	3407	4701	5008	3542	5388	1778
ESP	1	6	FPO	>=18 and <24m	fishing days	2	1	0	0	0	0
ESP	1	6	FPO	>24m	fishing days	99	15	51	66	44	35
ESP	1	6	GNC	<12m	fishing days	0	0	37	0	0	0
ESP	1	6	GNC	>=12 and <18m	fishing days	3	0	0	0	0	0
ESP	1	6	GND	>=12 and <18m	fishing days	10	0	0	0	0	0
ESP	1	6	GNS	<12m	fishing days	15932	14325	16267	7631	8285	8129
ESP	1	6	GNS	>=12 and <18m	fishing days	1751	1456	1366	1913	1380	1427
ESP	1	6	GNS	>=18 and <24m	fishing days	0	1	0	0	0	1
ESP	1	6	GNS	>24m	fishing days	2	0	0	0	0	0
ESP	1	6	GTN	<12m	fishing days	21	65	120	122	198	720
ESP	1	6	GTN	>=12 and <18m	fishing days	5	9	2	5	8	2
ESP	1	6	GTR	<12m	fishing days	33118	34184	29208	27632	33063	32733
ESP	1	6	GTR	>=12 and <18m	fishing days	5033	6594	5994	6055	5731	5311
ESP	1	6	GTR	>24m	fishing days	8	1	0	0	0	0
ESP	1	6	LA	>=18 and <24m	fishing days	0	0	1	0	0	0
ESP	1	6	LHM	<12m	fishing days	1	13	12	13	10	0

ESP	1	6	LHM	>=12 and <18m	fishing days	39	28	9	1	0	9
ESP	1	6	LHM	>=18 and <24m	fishing days	0	15	3	0	0	0
ESP	1	6	LHM	>24m	fishing days	0	0	0	1	0	0
ESP	1	6	LHP	<12m	fishing days	115	58	55	2009	774	1409
ESP	1	6	LHP	>=12 and <18m	fishing days	24	56	34	63	181	147
ESP	1	6	LLD	<12m	fishing days	10	60	10	30	31	21
ESP	1	6	LLD	>=12 and <18m	fishing days	1456	1333	1401	1229	1193	1193
ESP	1	6	LLD	>=18 and <24m	fishing days	648	634	759	679	579	585
ESP	1	6	LLD	>24m	fishing days	212	67	131	207	193	129
ESP	1	6	LLS	<12m	fishing days	6261	7145	5203	8615	6167	4844
ESP	1	6	LLS	>=12 and <18m	fishing days	1045	1918	1857	1126	2024	1513
ESP	1	6	LLS	>=18 and <24m	fishing days	63	6	4	0	37	0
ESP	1	6	LLS	>24m	fishing days	2	52	0	0	0	0
ESP	1	6	LTL	<12m	fishing days	0	1	0	6	0	0
ESP	1	6	LTL	>=12 and <18m	fishing days	0	0	0	0	1	0
ESP	1	6	OTB	<12m	fishing days	1947	2159	1591	1477	1300	885
ESP	1	6	OTB	>=12 and <18m	fishing days	13872	15923	13560	17389	17737	14822
ESP	1	6	OTB	>=18 and <24m	fishing days	34724	38923	34727	38576	37822	35517
ESP	1	6	OTB	>24m	fishing days	26366	26191	23683	18970	18944	17977
ESP	1	6	OTM	>=12 and <18m	fishing days	0	0	0	1	1	0
ESP	1	6	OTM	>=18 and <24m	fishing days	0	0	0	0	15	14
ESP	1	6	OTM	>24m	fishing days	0	0	0	1	0	0
ESP	1	6	PS	<12m	fishing days	353	382	311	128	223	149
ESP	1	6	PS	>=12 and <18m	fishing days	5314	6102	5597	4611	3439	2961
ESP	1	6	PS	>=18 and <24m	fishing days	10632	11478	10988	9650	8787	7785
ESP	1	6	PS	>24m	fishing days	2806	2920	2902	3021	2676	2310
ESP	1	6	SV	<12m	fishing days	747	2236	1166	313	2241	1703
ESP	1	6	SV	>=12 and <18m	fishing days	27	2	6	6	3	0

ESP	1	7	FPO	<12m	fishing days	1	0	0	0	0	0
ESP	1	7	GNS	>=12 and <18m	fishing days	0	0	0	1	0	0
ESP	1	7	GTR	<12m	fishing days	0	0	0	0	0	17
ESP	1	7	GTR	>=12 and <18m	fishing days	0	0	0	3	0	0
ESP	1	7	LHM	>=12 and <18m	fishing days	0	6	3	0	0	0
ESP	1	7	LHM	>=18 and <24m	fishing days	0	5	0	0	0	0
ESP	1	7	LLD	>=12 and <18m	fishing days	10	84	32	26	29	14
ESP	1	7	LLD	>=18 and <24m	fishing days	1	26	7	0	0	0
ESP	1	7	LLS	<12m	fishing days	8	0	0	0	0	97
ESP	1	7	LLS	>=12 and <18m	fishing days	127	49	88	136	20	53
ESP	1	7	LLS	>=18 and <24m	fishing days	97	11	0	0	16	0
ESP	1	7	OTB	>=12 and <18m	fishing days	224	90	62	19	14	61
ESP	1	7	OTB	>=18 and <24m	fishing days	1398	1227	1069	539	230	547
ESP	1	7	OTB	>24m	fishing days	2177	2116	2112	833	405	1202
ESP	1	7	PS	<12m	fishing days	0	0	1	0	0	0
ESP	1	7	PS	>=12 and <18m	fishing days	3	1	9	7	16	7
ESP	1	7	PS	>=18 and <24m	fishing days	4	12	14	6	3	4
ESP	1	7	PS	>24m	fishing days	5	3	0	1	0	0
ESP	1	7	SV	<12m	fishing days	0	0	0	0	0	63
FRA	1	7	DRB	<12m	fishing days	1450	2106	1577	1813	1336	695
FRA	1	7	DRB	>=12 and <18m	fishing days	1	0	0	0	0	0
FRA	1	7	FPO	<12m	fishing days	7101	7661	8632	8750	8026	6949
FRA	1	7	FPO	>=12 and <18m	fishing days	55	49	8	122	150	70
FRA	1	7	FYK	<12m	fishing days	12624	16783	14624	14261	9771	7945
FRA	1	7	GNC	<12m	fishing days	8663	8328	9447	9349	7299	6785
FRA	1	7	GNC	>=12 and <18m	fishing days	0	0	0	0	1	50
FRA	1	7	GND	<12m	fishing days	177	62	128	260	188	158
FRA	1	7	GNS	<12m	fishing days	29042	27882	29917	26182	22729	19590

FRA	1	7	GNS	>=12 and <18m	fishing days	299	229	149	191	137	57
FRA	1	7	GTN	<12m	fishing days	3927	4014	4268	4445	3758	3368
FRA	1	7	GTN	>=12 and <18m	fishing days	2	6	0	0	0	0
FRA	1	7	GTR	<12m	fishing days	33297	35092	38813	34545	31841	30151
FRA	1	7	GTR	>=12 and <18m	fishing days	253	320	170	151	31	80
FRA	1	7	LHP	<12m	fishing days	1182	928	1315	1621	1788	1663
FRA	1	7	LHP	>=12 and <18m	fishing days	0	1	1	4	51	89
FRA	1	7	LLD	<12m	fishing days	2938	2165	2594	2591	1484	1780
FRA	1	7	LLD	>=12 and <18m	fishing days	235	137	202	358	265	241
FRA	1	7	LLS	<12m	fishing days	5403	5241	5638	4939	5877	4953
FRA	1	7	LLS	>=12 and <18m	fishing days	15	17	75	25	1	0
FRA	1	7	LNB	<12m	fishing days	883	987	691	947	427	194
FRA	1	7	LTL	<12m	fishing days	352	350	254	268	72	95
FRA	1	7	NO	<12m	fishing days	8939	8699	6805	6199	5944	3361
FRA	1	7	OTB	<12m	fishing days	1301	1045	1240	1395	1412	1147
FRA	1	7	OTB	>=12 and <18m	fishing days	0	3	0	0	0	0
FRA	1	7	OTB	>=18 and <24m	fishing days	4525	4524	4139	3634	3510	3020
FRA	1	7	OTB	>24m	fishing days	5323	4430	2925	2597	2527	2005
FRA	1	7	OTM	>=18 and <24m	fishing days	15	21	5	4	7	3
FRA	1	7	OTM	>24m	fishing days	383	339	348	407	293	316
FRA	1	7	OTT	>=18 and <24m	fishing days	93	186	478	454	803	1396
FRA	1	7	OTT	>24m	fishing days	500	1415	2644	2864	3114	3060
FRA	1	7	PS	<12m	fishing days	945	1233	1108	668	842	630
FRA	1	7	PS	>=12 and <18m	fishing days	69	65	117	96	27	67
FRA	1	7	PS	>=18 and <24m	fishing days	113	118	105	90	62	43
FRA	1	7	PS	>24m	fishing days	0	0	8	0	52	189
FRA	1	7	SB	<12m	fishing days	314	10	217	224	213	136
FRA	1	7	SB	>=12 and <18m	fishing days	3	0	0	0	0	0

FRA	1	7	SV	<12m	fishing days	8	0	17	0	0	0
FRA	1	7	TBB	<12m	fishing days	517	280	245	219	169	45
FRA	2	8	FPO	<12m	fishing days	175	229	175	225	190	115
FRA	2	8	FPO	>=12 and <18m	fishing days	22	0	0	0	0	1
FRA	2	8	FYK	<12m	fishing days	461	262	152	506	277	120
FRA	2	8	GNC	<12m	fishing days	12	15	11	66	120	57
FRA	2	8	GNS	<12m	fishing days	2406	1751	1530	1193	1033	874
FRA	2	8	GNS	>=12 and <18m	fishing days	0	0	0	0	15	7
FRA	2	8	GTN	<12m	fishing days	422	421	199	193	255	108
FRA	2	8	GTR	<12m	fishing days	13864	13926	12486	10934	10845	9383
FRA	2	8	GTR	>=12 and <18m	fishing days	0	0	0	122	324	173
FRA	2	8	LHP	<12m	fishing days	0	69	91	18	16	0
FRA	2	8	LLD	<12m	fishing days	759	1100	985	553	369	262
FRA	2	8	LLS	<12m	fishing days	1246	1879	1871	1135	971	1005
FRA	2	8	LLS	>=12 and <18m	fishing days	0	0	0	16	0	30
FRA	2	8	LNB	<12m	fishing days	0	0	0	0	0	30
FRA	2	8	NO	<12m	fishing days	1150	1237	1143	1036	1108	917
FRA	2	8	OTB	<12m	fishing days	200	137	0	0	0	0
FRA	2	8	OTB	>=12 and <18m	fishing days	488	584	452	341	282	319
FRA	2	8	OTB	>=18 and <24m	fishing days	22	56	83	65	24	12
FRA	2	8	OTB	>24m	fishing days	130	147	163	183	157	147
FRA	2	8	OTM	>=12 and <18m	fishing days	2	0	0	0	0	0
FRA	2	8	OTM	>24m	fishing days	0	0	0	1	0	5
FRA	2	8	PS	<12m	fishing days	178	210	174	270	114	36
FRA	2	8	SB	<12m	fishing days	16	0	0	0	0	0
ITA	2	9	DRB	<12m	fishing days	0	0	0	12380	4042	6313
ITA	2	9	DRB	>=12 and <18m	fishing days	1560	1883	361	75	104	0
ITA	2	9	FPO	<12m	fishing days	383	158	2606	1810	1508	2849

ITA	2	9	FPO	>=12 and <18m	fishing days	73	0	74	238	542	181
ITA	2	9	FPO	>=18 and <24m	fishing days	0	0	0	0	1	0
ITA	2	9	FPO	>24m	fishing days	0	0	0	0	21	0
ITA	2	9	FYK	<12m	fishing days	1232	3564	5882	3986	818	99
ITA	2	9	FYK	>=12 and <18m	fishing days	0	0	0	0	14	7
ITA	2	9	GND	<12m	fishing days	0	0	3	0	0	1
ITA	2	9	GND	>=12 and <18m	fishing days	0	0	3	0	1	4
ITA	2	9	GND	>24m	fishing days	0	0	4	0	0	0
ITA	2	9	GNS	<12m	fishing days	41908	35689	38764	33259	21138	16550
ITA	2	9	GNS	>=12 and <18m	fishing days	2950	2260	2802	2443	2704	1609
ITA	2	9	GNS	>=18 and <24m	fishing days	0	0	0	2	0	0
ITA	2	9	GTR	<12m	fishing days	86844	75350	58594	63029	53852	35255
ITA	2	9	GTR	>=12 and <18m	fishing days	1940	1627	1343	692	1010	423
ITA	2	9	GTR	>=18 and <24m	fishing days	0	0	0	0	7	0
ITA	2	9	LHM	<12m	fishing days	0	0	0	0	25	3
ITA	2	9	LHM	>=12 and <18m	fishing days	0	0	8	0	0	0
ITA	2	9	LHP	<12m	fishing days	0	0	0	0	0	23
ITA	2	9	LLD	<12m	fishing days	5140	4504	6294	2947	3428	3830
ITA	2	9	LLD	>=12 and <18m	fishing days	1403	1632	2063	3304	2111	1613
ITA	2	9	LLD	>=18 and <24m	fishing days	0	0	0	0	103	60
ITA	2	9	LLD	>24m	fishing days	0	0	0	0	0	22
ITA	2	9	LLS	<12m	fishing days	2066	1322	2881	3722	2527	3026
ITA	2	9	LLS	>=12 and <18m	fishing days	268	537	449	807	1178	1015
ITA	2	9	OTB	<12m	fishing days	3291	3769	1139	2305	3159	2369
ITA	2	9	OTB	>=12 and <18m	fishing days	23922	22250	21613	20534	18402	14315
ITA	2	9	OTB	>=18 and <24m	fishing days	24055	23667	23139	19921	19310	15118
ITA	2	9	OTB	>24m	fishing days	1667	1615	1568	1490	1356	1748
ITA	2	9	OTM	<12m	fishing days	0	0	0	11	0	0

ITA	2	9	OTM	>=12 and <18m	fishing days	0	0	0	31	125	33
ITA	2	9	OTM	>=18 and <24m	fishing days	0	0	485	174	272	111
ITA	2	9	OTM	>24m	fishing days	0	0	173	206	100	171
ITA	2	9	PS	<12m	fishing days	48	1063	1207	1799	12	18
ITA	2	9	PS	>=12 and <18m	fishing days	2203	1905	985	1629	1712	811
ITA	2	9	PS	>=18 and <24m	fishing days	843	869	3108	713	1091	539
ITA	2	9	PS	>24m	fishing days	1269	1039	0	1224	1193	1152
ITA	2	9	SB	<12m	fishing days	0	0	0	0	0	382
ITA	2	9	SV	<12m	fishing days	2132	2475	1565	1645	938	785
ITA	2	9	SV	>=12 and <18m	fishing days	326	259	233	291	216	46
ITA	2	9	TBB	<12m	fishing days	0	0	0	0	21	184
ITA	2	9	TBB	>=12 and <18m	fishing days	0	0	0	161	126	0
ITA	2	9	TBB	>=18 and <24m	fishing days	0	0	0	33	333	339
ITA	2	9	TBB	>24m	fishing days	0	0	0	0	39	9
ITA	2	10	DRB	<12m	fishing days	0	0	0	133	1597	2163
ITA	2	10	DRB	>=12 and <18m	fishing days	889	805	43	614	664	0
ITA	2	10	FPO	<12m	fishing days	6375	6535	13522	6450	9405	9855
ITA	2	10	FPO	>=12 and <18m	fishing days	0	0	342	656	722	162
ITA	2	10	FYK	<12m	fishing days	0	0	446	0	0	0
ITA	2	10	GND	<12m	fishing days	94	889	1459	5811	5610	5288
ITA	2	10	GND	>=12 and <18m	fishing days	42	37	32	166	249	255
ITA	2	10	GND	>=18 and <24m	fishing days	0	0	0	0	15	47
ITA	2	10	GNS	<12m	fishing days	49962	62367	52273	43171	38857	28463
ITA	2	10	GNS	>=12 and <18m	fishing days	1300	905	2297	433	1503	385
ITA	2	10	GNS	>=18 and <24m	fishing days	0	0	0	44	0	45
ITA	2	10	GTR	<12m	fishing days	109184	104178	103651	132186	104408	57297
ITA	2	10	GTR	>=12 and <18m	fishing days	546	1379	1206	256	580	91
ITA	2	10	GTR	>=18 and <24m	fishing days	0	0	0	0	6	19

ITA	2	10	LHM	<12m	fishing days	11136	10649	16330	13139	9532	36
ITA	2	10	LHM	>=12 and <18m	fishing days	0	0	459	0	22	0
ITA	2	10	LHM	>=18 and <24m	fishing days	0	0	0	0	3	0
ITA	2	10	LHP	<12m	fishing days	0	0	0	0	0	6256
ITA	2	10	LHP	>=12 and <18m	fishing days	0	0	0	0	0	39
ITA	2	10	LLD	<12m	fishing days	24840	33181	7888	11248	7941	5480
ITA	2	10	LLD	>=12 and <18m	fishing days	10835	9483	6063	5763	6231	3178
ITA	2	10	LLD	>=18 and <24m	fishing days	398	1312	212	1146	569	807
ITA	2	10	LLD	>24m	fishing days	0	0	0	0	57	28
ITA	2	10	LLS	<12m	fishing days	27687	29156	22801	18103	13551	18651
ITA	2	10	LLS	>=12 and <18m	fishing days	4729	3385	2748	2290	1851	1870
ITA	2	10	LLS	>=18 and <24m	fishing days	0	0	19	55	56	33
ITA	2	10	LTL	<12m	fishing days	98	0	0	0	0	0
ITA	2	10	OTB	<12m	fishing days	381	523	1512	666	1360	897
ITA	2	10	OTB	>=12 and <18m	fishing days	20611	25762	23280	19797	17546	14719
ITA	2	10	OTB	>=18 and <24m	fishing days	9763	9335	11501	13024	8819	7372
ITA	2	10	OTB	>24m	fishing days	0	0	0	0	1801	707
ITA	2	10	OTM	<12m	fishing days	0	0	0	7	0	0
ITA	2	10	OTM	>=12 and <18m	fishing days	3538	0	0	3	10	0
ITA	2	10	OTM	>=18 and <24m	fishing days	252	0	457	355	417	200
ITA	2	10	OTM	>24m	fishing days	0	0	0	0	108	22
ITA	2	10	PS	<12m	fishing days	20573	22777	15311	17284	15941	11853
ITA	2	10	PS	>=12 and <18m	fishing days	7896	19145	8804	7699	6578	3399
ITA	2	10	PS	>=18 and <24m	fishing days	2455	4132	3073	2241	1863	1043
ITA	2	10	PS	>24m	fishing days	360	314	239	495	781	549
ITA	2	10	PTM	<12m	fishing days	0	0	0	0	5	0
ITA	2	10	SB	<12m	fishing days	0	0	0	0	0	6
ITA	2	10	SV	<12m	fishing days	419	613	0	978	641	288

ITA	2	10	SV	>=12 and <18m	fishing days	0	0	0	32	122	9
ITA	2	10	TBB	<12m	fishing days	0	0	0	0	8	0
ITA	2	11	FPO	<12m	fishing days	38433	39800	33235	41263	39213	43031
ITA	2	11	FPO	>=12 and <18m	fishing days	1423	2636	2056	2780	2811	2921
ITA	2	11	FPO	>24m	fishing days	0	0	0	0	27	0
ITA	2	11	FYK	<12m	fishing days	87	719	6300	0	0	0
ITA	2	11	GND	>=12 and <18m	fishing days	0	0	0	0	0	6
ITA	2	11	GNS	<12m	fishing days	19422	26854	14738	32854	28409	26250
ITA	2	11	GNS	>=12 and <18m	fishing days	147	1332	1312	1130	1427	911
ITA	2	11	GNS	>=18 and <24m	fishing days	0	0	2	0	0	0
ITA	2	11	GTR	<12m	fishing days	56692	52718	53889	37347	26815	30092
ITA	2	11	GTR	>=12 and <18m	fishing days	5967	4394	3356	3861	3815	1552
ITA	2	11	GTR	>=18 and <24m	fishing days	0	0	54	0	0	0
ITA	2	11	GTR	>24m	fishing days	0	0	0	0	0	1
ITA	2	11	LHM	<12m	fishing days	163	915	0	0	151	0
ITA	2	11	LHM	>=12 and <18m	fishing days	84	54	22	0	130	63
ITA	2	11	LHP	<12m	fishing days	0	0	0	0	0	288
ITA	2	11	LHP	>=12 and <18m	fishing days	0	0	0	0	0	18
ITA	2	11	LHP	>=18 and <24m	fishing days	0	0	0	0	0	3
ITA	2	11	LLD	<12m	fishing days	1530	1476	117	1302	1022	275
ITA	2	11	LLD	>=12 and <18m	fishing days	3707	3584	1921	1541	1651	772
ITA	2	11	LLD	>=18 and <24m	fishing days	0	0	117	700	1024	422
ITA	2	11	LLS	<12m	fishing days	4632	3224	5791	1965	2965	5304
ITA	2	11	LLS	>=12 and <18m	fishing days	787	711	629	445	388	343
ITA	2	11	LLS	>=18 and <24m	fishing days	0	0	7	1	6	22
ITA	2	11	LTL	<12m	fishing days	0	20	0	0	0	0
ITA	2	11	OTB	<12m	fishing days	0	0	73	1112	953	836
ITA	2	11	OTB	>=12 and <18m	fishing days	8828	9262	9008	10267	9560	5820

ITA	2	11	OTB	>=18 and <24m	fishing days	3021	4123	3809	5379	4689	3943
ITA	2	11	OTB	>24m	fishing days	3428	3540	3396	4482	3677	3078
ITA	2	11	OTM	>=12 and <18m	fishing days	0	0	0	0	28	0
ITA	2	11	OTM	>=18 and <24m	fishing days	0	0	0	0	21	0
ITA	2	11	PS	<12m	fishing days	0	0	0	4	72	13
ITA	2	11	PS	>=12 and <18m	fishing days	1245	961	0	52	202	144
ITA	2	11	PS	>=18 and <24m	fishing days	0	0	496	418	364	53
ITA	2	11	PTM	>=18 and <24m	fishing days	0	0	0	0	1	0
ITA	2	11	SV	<12m	fishing days	0	0	53	0	7	0
ITA	2	11	SV	>=12 and <18m	fishing days	0	0	0	0	6	0
ITA	2	11	TBB	>=18 and <24m	fishing days	0	0	0	0	2	0

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KJ-AX-21-017-EN-N

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doi:10.2760/622806

ISBN 978-92-76-45527-1