



ICES

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the Exploration of the Sea

CIEM

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2021 FRSG Expert Group ToR's

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Generic ToRs for Regional and Species Working Groups

2020/2/FRSG01 The following ToRs apply to: AFWG, HAWG, NWWG, NIPAG, WGWIDE, WGBAST, WGBFAS, WGNSSK, WGCSE, WGDEEP, WGBIE, WGEEL, WGEF, WGHANSA and WGNAS.

The working group should focus on:

- a) Consider and comment on Ecosystem and Fisheries overviews where available;
- b) For the aim of providing input for the Fisheries Overviews, consider and comment on the following for the fisheries relevant to the working group:
 - i) descriptions of ecosystem impacts on fisheries
 - ii) descriptions of developments and recent changes to the fisheries
 - iii) mixed fisheries considerations, and
 - iv) emerging issues of relevance for management of the fisheries;
- c) Conduct an assessment on the stock(s) to be addressed in 2021 using the method (assessment, forecast or trends indicators) as described in the stock annex and produce a **brief** report of the work carried out regarding the stock, providing summaries of the following where relevant:
 - i) Input data and examination of data quality; in the event of missing or inconsistent survey or catch information refer to the ACOM document for dealing with COVID-19 pandemic disruption and the linked template that formulates how deviations from the stock annex are to be [reported](#).
 - ii) Where misreporting of catches is significant, provide qualitative and where possible quantitative information and describe the methods used to obtain the information;
 - iii) For relevant stocks (i.e., all stocks with catches in the NEAFC Regulatory Area), estimate the percentage of the total catch that has been taken in the NEAFC Regulatory Area in 2020.
 - iv) Estimate MSY reference points or proxies for the category 3 and 4 stocks
 - v) Evaluate spawning stock biomass, total stock biomass, fishing mortality, catches (projected landings and discards) using the method described in the stock annex;
 - 1) for category 1 and 2 stocks, in addition to the other relevant model diagnostics, the recommendations and decision tree formulated by WKFORBIAS (see Annex 2 of https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/WKFORBIAS_2019.pdf) should be considered as guidance to determine whether an assessment remains sufficiently robust for providing advice.
 - 2) b. If the assessment is deemed no longer suitable as basis for advice, consider whether it is possible and feasible to resolve the issue through an interbenchmark. If this is

not possible, consider providing advice using an appropriate Category 2 to 5 approach.;

vi) The state of the stocks against relevant reference points;

Consistent with ACOM's 2020 decision, the basis for Fpa should be Fp.05.

- 1) 1. Where Fp.05 for the current set of reference points is reported in the relevant benchmark report, replace the value and basis of Fpa with the information relevant for Fp.05
- 2) 2. Where Fp.05 for the current set of reference points is not reported in the relevant benchmark report, compute the Fp.05 that is consistent with the current set of reference points and use as Fpa. A review/audit of the computations will be organized.
- 3) 3. Where Fp.05 for the current set of reference points is not reported and cannot be computed, retain the existing basis for Fpa.

vii) Catch scenarios for the year(s) beyond the terminal year of the data for the stocks for which ICES has been requested to provide advice on fishing opportunities;

viii) Historical and analytical performance of the assessment and catch options with a succinct description of associated quality issues. For the analytical performance of category 1 and 2 age-structured assessments, report the mean Mohn's rho (assessment retrospective bias analysis) values for time series of recruitment, spawning stock biomass, and fishing mortality rate. The WG report should include a plot of this retrospective analysis. The values should be calculated in accordance with the "Guidance for completing ToR viii) of the Generic ToRs for Regional and Species Working Groups - Retrospective bias in assessment" and reported using the ICES application for this purpose.

d) Produce a first draft of the advice on the stocks under considerations according to ACOM guidelines.

i. In the section 'Basis for the assessment' under input data match the survey names with the relevant "SurveyCode" listed ICES [survey naming convention](#) (*restricted access*) and add the "SurveyCode" to the advice sheet.

e) Review progress on benchmark issues and processes of relevance to the Expert Group.

i) update the benchmark issues lists for the individual stocks;

ii) review progress on benchmark issues and identify potential benchmarks to be initiated in 2022 for conclusion in 2023;

iii) determine the prioritization score for benchmarks proposed for 2022–2023;

iv) as necessary, document generic issues to be addressed by the Benchmark Oversight Group (BOG)

f) Prepare the data calls for the next year's update assessment and for planned data evaluation workshops;

g) Identify research needs of relevance to the work of the Expert Group.

- h) Review and update information regarding operational issues and research priorities on the Fisheries Resources Steering Group SharePoint site.
- i) If not completed in 2020, complete the audit spread sheet 'Monitor and alert for changes in ecosystem/fisheries productivity' for the new assessments and data used for the stocks. Also note in the benchmark report how productivity, species interactions, habitat and distributional changes, including those related to climate-change, could be considered in the advice.

Information of the stocks to be considered by each Expert Group is available [here](#).

AFWG – Arctic Fisheries Working Group

This resolution was approved 3 November 2020

2020/2/FRSG02 The **Arctic Fisheries Working Group (AFWG)**, chaired by Daniel Howell, Norway, will meet online 14–20 April 2021 to:

- a) Address generic ToRs for Regional and Species Working Groups, for all stocks except the Barents Sea capelin, which will be addressed at a meeting in the autumn;
- b) For Barents Sea capelin oversee the process of providing intersessional assessment;
- c) Conduct reviews as required of time any series computed using the STOX and ECA open source software for use in assessment in the Barents Sea.

The assessments will be carried out on the basis of the Stock Annex. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group on the dates specified in the 2021 ICES data call.

AFWG will report by 7 May 2021 and XX October 2021 for Barents Sea capelin for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

HAWG – Herring Assessment Working Group for the Area South of 62°N

This resolution was approved 3 November 2020

2020/2/FRSG03 The **Herring Assessment Working Group for the Area South of 62°N (HAWG)**, chaired by Afra Egan, Ireland, and Cecilie Kvamme*, Norway will meet:

online 20–22 January 2021 to:

- a) Compile the catch data of sandeel in assessment areas 1r, 2r, 3r, 4, 5r, 6, and 7r and address generic ToRs for Regional and Species Working Groups that are specific to sandeel stocks in the North Sea ecoregion;

and in Copenhagen, Denmark 16–24 March 2021 to:

- b) compile the catch data of North Sea and Western Baltic herring on 16–17 March;
- c) address generic ToRs for Regional and Species Working Groups 18–24 March for all other stocks assessed by HAWG.

The assessments will be carried out based on the Stock Annex. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group on the dates specified in the 2021 ICES data call.

HAWG will report by 12 February (sandeel), 29 March (sprat) and 7 April (herring) 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

NIPAG – Joint NAFO/ICES *Pandalus* Assessment Working Group

This resolution was approved 3 November 2020

2020/2/FRSG04 The **Joint NAFO/ICES *Pandalus* Assessment Working Group** (NIPAG), chaired by Ole Ritzau Eigaard, Denmark (ICES) and Brian Healey, Canada (NAFO), will meet by correspondence, 25–26 February 2021, to:

- a) Address generic ToRs for Regional and Species Working Groups for Northern shrimp in divisions 3.a and 4.a East stock.

NIPAG will report by 5 March 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

NWWG – North–Western Working Group

This resolution was approved on the Resolutions Forum 15 January 2021

2020/2/FRSG05 The **North–Western Working Group** (NWWG), chaired by Teunis Jansen*, Denmark, will meet by correspondence on 22–29 April 2021 to:

- a) Address generic ToRs for Regional and Species Working Groups for all stocks, except stocks mentioned in ToRs c) and d)
- b) Compile and review available data and information on plaice in Division 5.a and prepare a road map and issue list for a future benchmark

and on 6–8 September 2021 to:

- c) Address generic ToRs for Regional and Species Working Groups for beaked redfish (*Sebastes mentella*) in ICES subareas 5, 12, and 14 (Iceland and Faroe grounds, North of Azores, East of Greenland) and NAFO subareas 1 and 2 deep pelagic (> 500m) and shallow pelagic (< 500m) stocks.

and on 25–29 October to:

- d) Address generic ToRs for Regional and Species Working Groups for Capelin (*Mallotus villosus*) in subareas 5 and 14 and Division 2.a west of 5°W, Cod (*Gadus morhua*) in Subdivision 5.b.1 (Faroe Plateau), Cod in Subdivision 5.b.2 (Faroe Bank,) Haddock (*Melanogrammus aeglefinus*) in Division 5.b (Faroese grounds) and Saithe (*Pollachius virens*) in Division 5.b (Faroese grounds).

The assessments will be carried out on the basis of the stock annex. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group on the dates specified in the 2021 ICES data call.

NWWG will report by 19 May, 10 September and 5 November 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGBAST – Baltic Salmon and Trout Assessment Working Group

This resolution was approved 3 November 2020

2020/2/FRSG06 The **Baltic Salmon and Trout Assessment Working Group** (WGBAST), chaired by Martin Kesler, Estonia, will meet online, 22–30 March 2021 to:

- a) Address relevant points in the Generic ToRs for Regional and Species Working Groups;

Material and data relevant for the meeting must be available to the group on the dates specified in the 2021 ICES data call.

WGBAST will report by 9 April 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGBFAS – Baltic Fisheries Assessment Working Group

The revised version of the resolution was approved 13 January 2021

2020/2/FRSG07 The **Baltic Fisheries Assessment Working Group** (WGBFAS) chaired by Mikaela Bergenius Nord, Sweden, will meet

on-line 19 and 29 March 2021 to:

- a) Evaluate the catch and survey data of Baltic Sea fish stocks, cod in Kattegat and sole in Skagerrak and Kattegat;

and at ICES HQ, Copenhagen, Denmark 13–20 April 2021.

- b) Address generic ToRs for Regional and Species Working Groups;
- c) Review the main result from WGMIXFISH, WGIAB, WGSAM, and WGBIFS with a focus on the biological processes and interactions of key species in the Baltic Sea;
- d) Test the sensitivity to the exclusion of particular survey indices for the stock ple.27.21-23 through a “leave one out” analysis.

The assessments will be carried out on the basis of the stock annex. The assessments must be available for audit on the first day of the meeting. Material and data relevant for the meeting must be available to the group on the dates specified in the 2021 ICES data call.

WGBFAS will report by 4th May 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGBIE- Working Group for the Bay of Biscay and Iberian waters Ecoregion

This resolution was approved 3 November 2020

2020/2/FRSG08 **The Working Group for the Bay of Biscay and Iberian waters Ecoregion** (WGBIE), chaired by Ching Villanueva, France, and Cristina Silva, Portugal, will meet in Copenhagen, Denmark, 5–12 May 2021 to:

- a) Address generic ToRs for Regional and Species Working Groups;
- b) Review progress on evaluating the potential for assessing FU29 and FU30 as one stock;
- c) Review results and recommendations from benchmark and other interim workshops to review the assessment methods for sole, hake, megrims and anglerfish stocks

The assessments will be carried out on the basis of the stock annex. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group on the dates specified in the 2020 ICES data call.

WGBIE will report by 21 May 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGCSE – Working Group for the Celtic Seas Ecoregion

2020/2/FRSG09 **The Working Group for the Celtic Seas Ecoregion** (WGCSE), chaired by Mathieu Lundy, UK and Sofie Nimmegeers, Belgium will meet Online, 5–14 May 2021 and by correspondence September / October 2021 to:

- a) Address generic ToRs for Regional and Species Working Groups;
- b) Report on reopened advice as appropriate;

The assessments will be carried out on the basis of the stock annex. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group on the dates specified in the 2020 ICES data call.

WGCSE will report by 25 May 2021 for the attention of ACOM, and by 1 October 2021 for *Nephrops* stocks, anglerfish and megrim in Rockall. Concerning ToR b) the group will report on the ACOM guidelines on reopening procedure of the advice before XX October and will report on reopened advice before XX October.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGDEEP – Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources

This resolution was approved 15 February 2021

2020/2/FRSG10 **Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources** (WGDEEP), chaired by Ivone Figueiredo, Portugal and Elvar Halldor Hallfredsson, Norway, will meet in Copenhagen, Denmark, 22–28 April 2021 to:

- a) Address generic ToRs for Regional and Species Working Groups.

- b) Complete the development of Stock Annexes for all the stocks assessed by WGDEEP, based on the most recent agreed assessment.
- c) Update the description of deep-water fisheries in both the NEAFC Regulatory Area and ICES area(s) by compiling data on catch/landings, fishing effort (inside versus outside the EEZs, in spawning areas, areas of local depletion, etc.), and discard statistics at the finest spatial resolution possible by ICES Subarea and Division and NEAFC Regulatory Area. In particular, describe and prepare a first advice draft of any new emerging deep-water fishery with the available data in the NEAFC Regulatory Area.
- d) Continue work on exploratory assessments for deep-water species.
- e) Evaluate the stock status of stocks in Icelandic waters for the provision of annual advice in 2021.
- f) Evaluate the stock status of stocks for the provision of biennial advice due in 2021.
- g) Compile and review available data and information on Atlantic wolffish (*Anarhichas lupus*) in Division 5.a and prepare a road map and issue list for a future benchmark.

The assessments will be carried out on the basis of the stock annex. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group on the dates specified in the 2020 ICES data call.

WGDEEP will report by 7 May 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGDIAD – Working Group on Science to Support Conservation, Restoration and Management of Diadromous Species

2020/2/FRSG11 The **Working Group on Science to Support Conservation, Restoration and Management of Diadromous Species** (WGDIAD), chaired by Dennis Ensing, UK (2021-2023), and Hugo Maxwell, Ireland (2019-2021) will meet by correspondence and annually at the ICES ASCs in September 2021, 2022 and 2023 to work on ToRs and generate deliverables as listed in the Table below.

WGDIAD will report on the activities of each year to FRSG by 31 December of that year.

Terms of Reference

- a) Collate and publish an inventory of working groups and international research programmes in the study of diadromous fish, as a framework to promote exchanging resources, approaches, and best practices;
- b) Provide a mechanism through which issues relating to diadromous fish species and their environment, including also aspects connected to estuarine and fresh water habitats used by these species, can be addressed and coordinated within the ICES science plan;
- c) Identify scientific needs and propose activities, including expert groups, theme sessions and symposia, to support the implementation of the Science Plan and the work of SCICOM and ACOM Experts Groups on diadromous species and review their outputs and list recommendations and/or conclusions;
- d) Assist FRSG and ICES to integrate important activities with those of other Expert Groups reporting to FRSG, other SGs and/or ACOM.

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Collate and publish an inventory of working groups and international research programmes in the study of diadromous fish, as a framework to promote exchanging resources, approaches, and best practices.	There is a need to coordinate and draw the various elements of ICES work together to support the management advice provided for multiple species of diadromous fish, particularly in delivering commitments under various regulations, including the EU-Habitats and Water Framework Directives, Data Collection Multi Annual Programme, and the EU Eel Regulation, but also in exchange of ideas, discussing different approaches, and promoting best practices.	1.4, 6.2, 5.2	Year 1, 2 and 3	Report of the WG and maintenance of a previously established network of diadromous fish experts.

b	Provide a mechanism through which issues relating to diadromous fish species and their environment, including also aspects connected to estuarine and fresh water habitats used by these species, can be addressed and coordinated within the ICES science plan.	WGDIAD brings together experts in the field of diadromous fish ecology, management, and conservation. Through the mechanism at the group's disposal the particular issues of diadromous fish management are addressed and coordinated in accordance with the ICES Science Plan.	6.2, 1.7, 1.9	Year 1, 2 and 3	Organise theme sessions, symposia or EGs. Liaise with experts of other EGs, and relevant sources outside ICES on issues relevant to diadromous fish, and report back on these activities in the annual report.
c	Identify scientific needs and propose activities, including experts groups, theme sessions and symposia, to support the implementation of the Science Plan and the work of SCICOM and ACOM Experts Groups on diadromous species and review their outputs and list recommendations and/or conclusions.	ICES is well placed to coordinate scientific activities which generate up to date information on the biology and ecology of diadromous species, threats to their status, including climate change, and advice on measures to be taken to restore habitats and ecosystems, and rebuild depleted populations.	3.2, 6.1, 5.2	Year 1, 2 and 3	Organise theme sessions, symposia or expert groups. Co-ordinate feedback from these sources for use in publications and CRR documents. Liaise with and support chairs of EGs and WKS to achieve their aims.
d	Assist FRSG and ICES to integrate important activities with those of other Expert Groups reporting to EPDSG, other and/or ACOM.	Issues relating to, for example, rare and data limited species are widely dispersed across the ICES Science plan. This group provides a focal point for both internal and external communication and reporting of new developments and concerns regarding SGs diadromous fish.	5.2, 5.1	Year 1, 2 and 3	Keep ICES abreast of important issues relating to Diadromous fish species and ensure these issues are communicated within the ICES community to relevant EGs and SGs.

Summary of the Work Plan

Year 1	Coordinate scientific activities (theme sessions, symposia, EGs, CRRs and reports to FRSG)
Year 2	Coordinate scientific activities (theme sessions, symposia, EGs, CRRs and reports to FRSG)
Year 3	Coordinate scientific activities (theme sessions, symposia, EGs, CRRs and reports to FRSG)

Supporting information

Priority	The Working Group will provide the mechanism to coordinate scientific activities relating to diadromous fish species and their environment in support of the ICES Science Plan. It will also permit ICES to respond fully to requests from NASCO and the EU/FAO/IUCN/CITES for scientific advice on management strategies, research needs and data deficiencies.
Resource requirements	Meeting facilities at the ASC in 2021-2023, including teleconferencing facilities
Participants	National representatives and other invited experts working with diadromous species
Secretariat facilities	Secretarial support for organisation of the meeting and preparation of the report.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	The proposal originates from FRSG but will have direct significance to ACOM for advice from WGNAS, WGBAST, and WGEEL in particular.
Linkages to other committees or groups	Besides FRSG, there are linkages to the SCICOM Steering Groups Ecosystem Observation, Human Activities, Pressures, and Impacts, and Ecosystem Processes and Dynamics and all Expert Groups working on issues of relevance for diadromous species in relation to improving scientific understanding and coordinating scientific activities.
Linkages to other organizations	NASCO, FAO, EIFAAC and GFCM, HELCOM, CITES, NPAFC.

WGEEL – Joint EIFAAC/ICES/GFCM Working Group on Eels

This resolution was approved 3 November 2020 and updated on Forum 12 Feb. 21

2020/2/FRSG12 The **Joint EIFAAC/ICES/GFCM Working Group on Eels** (WGEEL), chaired by Jan-Dag Pohlmann, Thünen Institute, Germany, will meet virtually and in Rabat (Morocco), in a split meeting from 7–10 September (virtually) and 27 September–4 October (Rabat) to:

- a) Address the generic EG ToRs from ICES, **and any requests from EIFAAC or GFCM**;
- b) Report on developments in the state of the European eel (*Anguilla anguilla*) stock, the fisheries on it and other anthropogenic impacts;
- c) Report on updates to the scientific basis of the advice, including any new or emerging threats or opportunities;
- d) Address the findings of WKFEA, consider their consequences for data collection, stock assessment and advice and make amendments to the current approach of the WG where necessary.

Material and data relevant for the meeting must be available to the group on the dates specified in the 2021 ICES data call.

WGEEL will report by Date, 11 October 2021 for the attention of ACOM, WGDIAD, FRSG and FAO, EIFAAC and GFCM.

Supporting Information

Priority	1. The status of the European eel stock remains outside safe biological limits and continuing and further management actions are required to recover the stock.
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	<p>2. The present stock status assessment is based on recruitment time series, which have no predictive power and therefore cannot be used to identify the most effective way to recover to stock nor the time scale over which recovery might be achieved. Therefore, the development and application of further status assessment methods are urgently required. Therefore the findings of WKFEA require particular attention.</p> <p>3. The Council Regulation (EC) 1100/2007 obliges EU Member States to report national stock indicators, to take management measures and to report progress. Non-EU countries have no such legal obligation, but the same aspirations are necessary to provide a whole-stock assessment and management. The Working Group continues to provide EIFAAC, ICES and the GFCM countries with support in implementing and improving such actions.</p> <p>4. The EU has requested annually recurring scientific advice on the European eel. Specifically, for eel, the advice is sought in support of the Eel Regulation (EC 1100/2007).</p>
Scientific justification	<p>European eel life history is complex and atypical among aquatic species. The stock is genetically panmictic and data indicate random arrival of adults in the spawning area. The continental eel stock is widely distributed and there are strong local and regional differences in population dynamics and local stock structures. Fisheries on all continental life stages take place throughout the distribution area. Local impacts by fisheries vary from almost nil to heavy overexploitation.</p> <p>Other forms of anthropogenic mortality (e.g. hydropower, pumping stations) also impact on eel and vary in distribution and local relevance.</p> <p>Most but not all EU Member States reported quantitative estimates of the required stock indicators to the EU in 2012, 2015 and 2018. The reliability and accuracy of these data have not yet been fully evaluated, but the ICES WKEMP will examine this. Furthermore, the stock indicators of some non-European countries within the natural range are lacking.</p>
Resource requirements	SharePoint, WebEx
Participants	EIFAAC, ICES and GFCM Working Group Participants, Invited Country Administrations, Client representative
Secretariat facilities	Support to organize the logistics of the meeting.
Financial	At countries expense
Linkages to advisory committees	ACOM
Linkages to other committees or groups	WGDIAD, SCICOM, FRSG
Linkages to other organizations	FAO EIFAAC, GFCM, EU DG-MARE, EU DG-ENV

WGEF – Working Group on Elasmobranch Fishes

This resolution was approved 3 November 2020

2020/2/FRSG13 The **Working Group Elasmobranch Fishes** (WGEF), chaired by Jurgen Batsleer (Netherlands) and Pascal Lorange (France), will meet in Portugal, Lisbon from 15 – 24 June 2021 to:

- a) Address generic ToRs for Regional and Species Working Groups.
- b) Update the description of elasmobranch fisheries for deep-water, pelagic and demersal species in the ICES area and compile landings, effort and discard statistics by ICES Subarea and Division, and catch data by NEAFC Regulatory Area. Describe and prepare a first Advice draft of any emerging elasmobranch fishery with the available data on catch/landings, fishing effort and discard

statistics at the finest spatial resolution possible in the NEAFC RA and ICES area(s);

- c) Evaluate the stock status for the provision of biennial advice due in 2021 for:
(i) skate stocks in the North Sea ecoregion, the Azores and MAR; (ii) catsharks (*Scyliorhinidae*) in the Greater North Sea, Celtic Seas and Bay of Biscay and Iberian Coast ecoregions; (iii) smooth-hounds in the Northeast Atlantic; and (iv) tope in the Northeast Atlantic)
- d) Conduct exploratory analyses and collate relevant data in preparation for the evaluation of other stocks (Porbeagle in the NE Atlantic; and skates in the Celtic Seas and Bay of Biscay and Iberian Coast ecoregions) in preparation for more detailed biennial assessment in 2022;
- e) Follow the outcomes of WKSKATE and to make the best use of survey indices in the assessments where appropriate.
- f) Take note of the outcome of the proposed stand-alone expert meeting dealing with the issue of missing data in the Portuguese surveys and the solutions suggested.
- g) Collate discard data from countries and fleets according to the ICES data call. Follow recommendations from WKSHARK3 and 5 to address the following issues: data quality and onboard coverage; raising factors; discard retention patterns between fleets and countries; and consider the output of WKSURVIVE to address discard survival and advise on how to include discard information in the assessment and advice accordingly;
- h) Carry out exploration analysis of effort data for stocks where time-series of effort may be used to decide on the application of the PA buffer. The use of effort data analysed in other ICES working groups should be favored, liaise with WGMIXFISH and WGSFD.
- i) Further develop MSY proxy reference points relevant for elasmobranchs and explore/apply in MSY Proxies analyses for selected stocks;
- j) Further develop the ToR for a proposed joint ICCAT-ICES meeting on porbeagle and other pelagic sharks.
- k) Work intersessionally to draft/update stock annexes and develop a procedure and schedule for subsequent reviews.
- l) Evaluate available data at species-specific level within the common skate-complex (*Dipturus* spp.) stock units in order to further increase our understanding of each individual species and their current status."

The assessments will be carried out on the basis of the stock annex in National Laboratories, prior to the meeting. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group no later than 14 days prior to the starting date.

WGEF will report by 9 August 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGHANSA – Working Group on Southern Horse Mackerel Anchovy and Sardine

2020/2/FRSG14 Draft ToRs will be provided by WGHANSA in December

WGHARP – Joint ICES/NAFO/NAMMCO Working Group on Harp and Hooded Seals

WGHARP has decided to cancel its 2021 meeting for the following reasons: There are no specific request for advice on harp and hooded seals this year and new seal abundance surveys will only take place in 2022; Experts are preparing a full benchmark meeting in 2022 and will be focusing in model development during 2021.

A new resolution will be submitted once meeting dates, location, and ToRs for 2022-2023 are agreed.

WGMIXFISH-ADVICE – Working Group on Mixed Fisheries Advice

2019/2/FRSG16 Draft ToRs will be provided by WGMIXFISH in December

WGMIXFISH-METHODS – Working Group on Mixed Fisheries Advice Methodology

The revised version of the resolution was approved 21 January 2021

2020/2/FRSG17 The **Working Group on Mixed Fisheries Methods** (WGMIXFISH-METHODS), chaired by Claire Moore, Ireland, will meet online 21 – 25 June 2021, to:

- a) Continue the improvement of WGMIXFISH-ADVICE workflow, updating associated documentation and increasing transparency;
- b) Respond to the outcomes of the Mixed Fisheries Scoping Meeting;
- c) Horizon scanning for future developments in methodology and advice
- d) Respond to the outcomes and issues encountered during WGMIXFISH-Advice;
- e) Review of updated data call, and data processing procedures, identifying possible areas of improvements;
- f) Develop mixed fisheries models for sea regions not currently covered in the mixed fisheries advice;
- g) Continue the development of the combined implementation of FCube and FLBEIA in conjugation with STECF/WGECON economists.
- h) Develop guidance for auditing of mixed fisheries advice.

WGMIXFISH-METHODS will report by 30 July 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group.

Supporting information

Priority:	The work is essential to ICES to progress in the development of its capacity to provide advice on multispecies fisheries. Such advice is necessary to fulfil the requirements stipulated in the MoUs between ICES and its client commissions.
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Scientific justification and relation to action plan:	<p>The issue of providing advice for mixed fisheries remains an important one for ICES. The Aframe project, which started on 1 April 2007 and finished on 31 March 2009 developed further methodologies for mixed fisheries forecasts. The work under this project included the development and testing of the FCube approach to modelling and forecasts.</p> <p>In 2008, SGMIXMAN produced an outline of a possible advisory format that included mixed fisheries forecasts. Subsequently, WKMIXFISH was tasked with investigating the application of this to North Sea advice for 2010. AGMIXNS further developed the approach when it met in November 2009 and produced a draft template for mixed fisheries advice. WGMIXFISH has continued this work since 2010.</p>
Resource requirements:	No specific resource requirements, beyond the need for members to prepare for and participate in the meeting.
Participants:	Experts with qualifications regarding mixed fisheries aspects, fisheries management and modelling based on limited and uncertain data.
Secretariat facilities:	Meeting facilities, production of report.
Financial:	None
Linkages to advisory committee:	ACOM
Linkages to other committees or groups:	SCICOM through the WGMG. Strong link to STECF.
Linkages to other organizations:	This work serves as a mechanism in fulfilment of the MoU with EC and fisheries commissions. It is also linked with STECF work on mixed fisheries.

WGNAM – Working Group on Northwest Atlantic Mackerel Ecology and Assessment

This resolution was approved on the Resolution Forum in October 2019

2019/2/FRSG33 A **Working Group on Northwest Atlantic Mackerel Ecology and Assessment** (WGNAM), co-chaired by Kiersten Curti, USA and Stephane Plourde, Canada, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2020	Tbd	tbd	Interim report by 30 Jun to Fisheries Resources Steering Group	First meeting postponed to 2021
Year 2021	TBD	USA	Interim report by to Fisheries Resources Steering Group	
Year 2022	TBD	Canada	Final report by to Fisheries Resources Steering Group	

ToR descriptors

ToR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Develop and evaluate hypotheses for decline in recruitment of Atlantic mackerel and identify research approaches to evaluate these hypotheses	<p>The biomass of the Northwest Atlantic Mackerel stock is low. One of the contributing factors is decreased recruitment.</p> <p>Hypotheses have been developed for the northern contingent, but these hypotheses have not been evaluated for the southern contingent. Further, the role of physical changes in the system, changes in movement patterns, changes in age-structure, and changes in reproductive dynamics have not been evaluated. This effort will take a holistic approach and consider evidence for a variety of recruitment hypotheses and then identify research approaches to evaluate the most promising ones.</p>	1.8, 6.6	3 years	Review paper
b	Evaluate population structure of Atlantic mackerel and consider the impact of spatial structure on the population dynamics in the region.	<p>Atlantic mackerel in the Northwest Atlantic have long been divided into a northern and southern contingents – definitions based on spawning areas and migratory patterns. The biological relationship between these two contingents is unclear. Population structure in small scombrids (including Northeastern Atlantic Atlantic mackerel) will be reviewed and new approaches identified to better understand population structure and migratory patterns in Northwestern Atlantic Atlantic mackerel.</p>	5.2	3 years	Report to ICES on research to better define population structure.

c	Compare and contrast data collection programs and modeling used for Atlantic Mackerel in the Northwest Atlantic and identify data needs and research topics that could improve assessments.	The Atlantic Mackerel stock is assessed separately by both the U.S. and Canada. In recent years, there has been increased collaboration in developing assessments. Science supporting the two assessmentst will be compared including data and models. Data reviewed should include but not be restricted to fishery independnet and dependernt surveys, acoustics, reproductive, aging, and habitat. From this comparison, data needs and research questions will be identified to improve assessments in the future..	5.1	3 years	Review paper
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Summary of the Work Plan

Year 1	THE WG WILL MEET AND ADDRESS EACH TOR.
Year 2	The WG will review drafts of papers developed following the year 1 meeting
Year 3	The WG will complete the review papers and submit for publication. A final report will also be completed.

Supporting information

Priority	To be completed.
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group will be attended by some 5-10 members and guests..
Secretariat facilities	WebEx coordination may be requested.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no obvious direct linkages but developing the expertise could link to ACOM in the future.
Linkages to other committees or groups	Interactions will be sought with WGMEGS and WGWIDE.
Linkages to other organizations	There are linkages to a number of organizations and institutions throughout North America

WGNAS – Working Group on North Atlantic Salmon

This resolution was approved 3 November 2020

2020/2/FRSG18 The **Working Group on North Atlantic Salmon** (WGNAS), chaired by Dennis Ensing*, UK, will meet Online 22–31 March 2021 to:

- a) Address relevant points in the Generic ToRs for Regional and Species Working Groups for each salmon stock complex;

b) Address questions posed by NASCO:

1. With respect to Atlantic salmon in the North Atlantic area:

- 1.1 provide an overview of salmon catches and landings by country, including unreported catches and catch and release, and production of farmed and ranched Atlantic salmon in 2020¹;
- 1.2 report on significant new or emerging threats to, or opportunities for, salmon conservation and management²;
- 1.3 provide a compilation of tag releases by country in 2020;
- 1.4 identify relevant data deficiencies, monitoring needs and research requirements;
- 1.5 review and update the General Considerations section (Annex 2) of the ICES Commissions' advice documents to include 'Environmental and other influences on the stock'.

2. With respect to Atlantic salmon in the North-East Atlantic Commission area:

- 2.1 describe the key events of the 2020 fisheries³;
- 2.2 review and report on the development of age-specific stock conservation limits, including updating the time-series of the number of river stocks with established CLs by jurisdiction;
- 2.3 describe the status of the stocks, including updating the time-series of trends in the number of river stocks meeting CLs by jurisdiction;
- 2.4 provide catch options or alternative management advice for the 2021 / 2022 – 2023 / 2024 fishing seasons, with an assessment of risks relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding⁴; and
- 2.5 update the Framework of Indicators used to identify any significant change in the previously provided multi-annual management advice.

3. With respect to Atlantic salmon in the North American Commission area:

- 3.1 describe the key events of the 2020 fisheries (including the fishery at St Pierre and Miquelon)³;
- 3.2 update age-specific stock conservation limits based on new information as available, including updating the time-series of the number of river stocks with established CLs by jurisdiction;
- 3.3 describe the status of the stocks, including updating the time-series of trends in the number of river stocks meeting CLs by jurisdiction;
- 3.4 provide catch options or alternative management advice for 2021 – 2024 with an assessment of risks relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding⁴; and

3.5 update the Framework of Indicators used to identify any significant change in the previously provided multi-annual management advice.

4. With respect to Atlantic salmon in the West Greenland Commission area:

4.1 describe the key events of the 2020 fisheries³;

4.2 describe the status of the stocks⁵;

4.3 provide catch options or alternative management advice for 2021 – 2023 with an assessment of risk relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding⁴; and

4.4 update the Framework of Indicators used to identify any significant change in the previously provided multi-annual management advice.

Notes:

1. *With regard to question 1.1, for the estimates of unreported catch the information provided should, where possible, indicate the location of the unreported catch in the following categories: in-river; estuarine; and coastal. Numbers of salmon caught and released in recreational fisheries should be provided.*
2. *With regard to question 1.2, ICES is requested to include reports on any significant advances in understanding of the biology of Atlantic salmon that is pertinent to NASCO, including information on any new research into the migration and distribution of salmon at sea and the potential implications of climate change for salmon management.*
3. *In the responses to questions 2.1, 3.1 and 4.1, ICES is asked to provide details of catch, gear, effort, composition and origin of the catch and rates of exploitation. For homewater fisheries, the information provided should indicate the location of the catch in the following categories: in-river; estuarine; and coastal. Information on any other sources of fishing mortality for salmon is also requested. For 4.1, if any new surveys are conducted and reported to ICES, ICES should review the results and advise on the appropriateness for incorporating resulting estimates into the assessment process).*
4. *In response to questions 2.4, 3.4 and 4.3, provide a detailed explanation and critical examination of any changes to the models used to provide catch advice and report on any developments in relation to incorporating environmental variables in these models. Also provide a detailed explanation and critical examination of any concerns with salmon data collected in 2020 which may affect the catch advice considering the restrictions on data collection programmes and fisheries due to the Covid-19 pandemic.*
5. *In response to question 4.2, ICES is requested to provide a brief summary of the status of North American and North-East Atlantic salmon stocks. The detailed information on the status of these stocks should be provided in response to questions 2.3 and 3.3.*

WGNAS will report by XXX 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGNSSK – Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak

This resolution was approved 3 November 2020

2020/2/FRSG19 The **Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak** (WGNSSK), chaired by Tanja Miethe, UK, and Raphaël Girardin, France, will meet in ICES HQ, Copenhagen, Denmark, 21–30 April 2021 and by correspondence in September 2021 to:

- a) Address generic ToRs for Regional and Species Working Groups.
- b) Assess Norway pout assessments by correspondence.
- c) Report on reopened advice as appropriate;
- d) Add ToR on Benchmark

The assessments will be carried out on the basis of the stock annex. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group on the dates specified in the 2021 ICES data call.

WGNSSK will report by 14 May 2021, and by 25 September 2021 (Norway pout) for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WGTAFGOV – Working Group on Transparent Assessment Framework Governance

This resolution was approved 1 October 2019

2019/2/FRSG19 The **Working Group on Transparent Assessment Framework Governance** (WGTAFGOV), chaired by Nils Olav Handegard (Norway) will be established and will meet 4 times per year via WebEx and may meet physically once per year, to work on ToRs and generate deliverables as listed in the Table below.

	<u>WEBEX Meeting dates</u>	<u>Meeting dates and Venue</u>	<u>Reporting details</u>	<u>Comments (change in Chair, etc.)</u>
Year 2020	1) 13 Feb 2) 14 May 3) 13 Aug 4) 12 Nov	31 January, ICES HQ, Copenhagen	Interim business report by 26 November to FRSG	
Year 2021	1) 11 Feb 2) 13 May 3) 12 Aug 4) 11 Nov	Dates and venue TBD	Interim business report by TBD to FRSG	
Year 2022	1) 10 Feb 2) 12 May 3) 11 Aug 4) 10 Nov	Dates and venue TBD	Final business report by TBD to FRSG	

WGTAFGOV will report on its activities by 26 November to ACOM, SCICOM, FRSG and DIG.

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Develop a governance framework setting out a forward looking plan, including future and existing objectives of TAF, responsibilities, processes and resources.	In order to successfully develop and maintain a workplan for TAF it is necessary to first establish a vision for the future of TAF, supported by guidance on handling of feedback, task prioritisation and expected resource availability.		3 years/ Generic ToR	The WGTAFGOV manifesto: a mission statement on the direction of TAF development and overarching short to medium term goals. Guidelines on how to prioritise. Definition of resources available. Definition of responsibilities.
b	<i>Based on the guidance established in ToR A:</i> Provide a channel for user feedback to the Transparent Assessment Framework. Feedback will be compiled by WGTAFGOV and appropriate actions to be taken with assigned responsibilities and resource requirements will be listed and prioritised.	TAF should develop to meet the requirements of a broad range of users and thus needs to be responsive to user feedback,. Feedback will be collected and organised using GitHub and the traditional recommendations system from ICES reports. To achieve a long-term stability, availability and quality, TAF development requires a workplan with clear objectives and milestones. This can only be successfully implemented when resource requirements have been estimated and the availability of resources is known.		3 years/ Generic ToR	A GitHub site allowing users to submit feedback and requests. Provide an annual workplan, with an agreed and prioritised list of TAF related EG recommendations along with suggested resource allocations, budget estimates and feasibility estimates.
c	<i>Using the guidance established in ToR</i>	The project planning cycle		3 years/ Generic ToR	Establish and maintain a

	<i>A and the feedback captured in ToR B:</i> Oversee and advise on the interpretation and prioritisation of recommendations and requests addressed to the Transparent Assessment Framework.	needs to be responsive (more than one meeting a year) in order to manage the TAF development effectively. Although there is an annual plan, short term priorities must be evaluated against resource availability and needs of the ICES advice processes that vary through the year.		project board on GitHub to manage tasks. Review project plan and agree on tasks to be completed. Review new tasks for addition to the workplan, or for consideration for the next annual workplan.
d	Oversee development of user guidance and training for the Transparent Assessment Framework.	As TAF develops over time a range of users will require various levels of training including step by step user manuals, tutorials and workshops. Documentation of guidelines and procedures will also be necessary. Outreach activities will be required.	3 years/ Generic ToR	Annually updated training documentation. Workshops with specific goals proposed and planned where necessary. Relevant fora for dissemination investigated and outreach activities planned.

Summary of the Work Plan.

Year 1	First meeting to establish ToRs a) and b) will be a physical meeting to be followed by quarterly WebEx meetings dealing with ToR c) and d). DIG will aid in review of ToR a).
Year 2	ToRs c) and d) will be addressed in quarterly WebEx meetings, with the potential annual meetings for prioritising ToRs a and b).
Year 3	ToRs c) and d) will be addressed in quarterly WebEx meetings, with the potential annual meetings for prioritising ToRs a and b).

Supporting information

Priority	High priority.
Resource requirements	A commitment of time from the members of the group consistent with progressing actions identified in the quarterly meetings.

Participants	ACOM Leadership and FRSG representative, one member each representing survey data, commercial data and stock assessments. Members with an overview of stock assessment results. ICES Secretariat and other related EG members as need be.
Secretariat facilities	Community Sharepoint site, remote meeting facilities.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	This is an integral component to the overall Quality Assurance Framework (of Advice) that ACOM together with the Coordination group are describing.
Linkages to other committees or groups	There is a strong linkage to DIG as the main umbrella for data/software governance structures.
Linkages to other organizations	DFO and NOAA have expressed interest in the system.

WGTRUTTA – Working Group with the Aim to Develop Assessment Models and Establish Biological Reference Points for Sea Trout (*Anadromous Salmo trutta*) Populations

This resolution was approved on the Resolution Forum in June 2020

2019/2/FRSG20 **The Working Group to develop and test assessment methods for Sea trout populations (anadromous *Salmo trutta*) (WGTRUTTA)**, chaired by Johan Höjesjö, Sweden, and Alan Walker, UK, will work on ToRs and generate deliverables as listed in the Table below.

The WG's 3-year term will run from June 2020 to May 2023.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2020	15–18 June	online meeting		Start-up meeting, learning lessons from WG1, preparing detailed workplan with roles & responsibilities, milestones & deliverables
Year 2021	19-21 January	Online meeting		Mid-year progress review and workshop
	29 June – 1 July	Online meeting	Interim report by 1 October	Review progress in year 1 and plans for years 2 & 3
Year 2022	DATE February	Dublin/Newport, Ireland		Mid-year progress review and workshop
	DATE July	online meeting	Interim report by 1 October	Review progress in Year 2 and plans for year 3
	DATE December	Rennes, France		Mid-year progress review and workshop
Year 2023	DATE May	online meeting		Draft the Final Report and consider a further term
	DATE October	Lisbon, Portugal	Final report by 1 October	Submit the Final Report

ToR descriptors

ToR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
A	Describe the life history drivers and distribution of sympatric sea and freshwater trout populations	The trout life cycle is highly variable over space and time, which renders assessment and management challenging. Our understanding of ecological patterns in trout phenology, life history and distribution across large scale environmental gradients is far from complete but is a prerequisite to improving sea trout management.	5.2	3 years	<p>A1. Fully establish the sea trout database, its population with data from all involved countries, and its preparation for inclusion as one of the official ICES databases.</p> <p>A2. Define a sub-set of variables for trout life history and habitat characteristics accounting for the between-stocks variances, for identifying key index rivers and for targeting stock-recruitment and state models.</p> <p>A3. Investigate trout distribution within rivers as a function of abiotic and biotic habitat characteristics.</p> <p>A4. Quantify the importance of anadromy for trout populations.</p>
B	Quantify the external pressures on trout populations in formats necessary to understand the state of local populations	Knowledge of the ecology of trout is limiting our ability to understand the consequences for trout populations of the rapidly increasing natural, anthropogenic, additive and cumulative impacts on aquatic environments.	2.1, 2.5, 5.6	3 years	<p>B1. Describe the current and potential future impacts of natural and anthropogenic impacts on trout populations.</p> <p>B2. Make recommendations for unified and standardized protocols for sampling trout,</p>

				<p>characterizing habitats and calibrating for extrapolations across the natural range.</p> <p>B3. Describe situations outside the Baltic where sea trout stocks may be exploited or otherwise impacted at an international scale.</p>
C	<p>Develop a toolbox of methods to assess stock and population state, based on a suite of options, and suitable for a range of scenarios found across the natural range of the sea trout.</p>	<p>The WG (2017-2019) developed approaches for assessing the state of trout populations, including (i) stock-recruitment models using metrics from various life stages by applying several curve fitting approaches to 'data rich' stocks with data from counts, returning stock estimates, catches, and juvenile abundance surveys, and (ii) length-based indicators using index catchments, to demonstrate state and identify where pressures may have had an impact; (iii) extended the application of the Trout Habitat Scores (THS); and collaborated on development of a theoretical Bayesian Population Dynamics Model for Baltic sea trout. These all require further development and testing with novel data and situations in order to advance them to a toolbox for managers and other stakeholders.</p>	3.2, 3.3, 6.1. 3 years	<p>C1. Examine the S/R models from WG (2017-2019) in terms of transfer functions, types and amounts of data required for setting BRPs, additional data and better and standardized reporting of catches.</p> <p>C2. Examination of the opportunities to develop regional versions of the Trout Habitat Score (THS) process across the native range of sea trout.</p> <p>C3. Develop the Bayesian model of sea trout</p> <p>C4. Develop and propose a data collection framework to support LBI type analysis of pressures on stocks, liaising with EU Regional Coordination Groups.</p> <p>C5. Define the methods for the forecast of catches that would be consistent with the ICES application of the precautionary approach and, in case it is desired, MSY,</p>

D	Develop solutions to achieve sustainable governance of trout stocks	Sustainable use and management of the anadromous sea trout is challenging for many reasons including because the fish use multiple environments and are subject to a variety of impacts and stressors, migrating across different ecological and legislative borders. In many European countries, sea trout fishers are not registered or licenced, and knowledge of effort and catch is insufficient or lacking. Knowledge of non-fishery impacts is even more data-poor.	7.1, 7.4, 7.7 3 years	D1. Describe the key ecological, social and economic management objectives for sea trout fisheries across the natural range, to identify the target audience requirements. D2. Define conservation reference points to ensure stock sustainability consistent with the precautionary approach. D3. Establish what level of socio-economic risk (uncertainty) is acceptable to fisheries managers in setting management reference points. D4. Explore and evaluate management strategies conducive to meeting socio-economic goals while ensuring the biological sustainability of the stocks.
		To effectively conserve the varied and multiple contributions from sea trout to society, social scientific knowledge must complement ecology. Economic valuation studies can clarify how the public, including participants and non-participants of sea trout fishing, benefit from and value sea trout. This may vary spatially between fisheries (e.g. between countries) and, moreover, is likely affected by different regulation regimes between regions. Comparative studies of governance across countries and levels can identify “best practice” and learning across jurisdictions.		

Summary of the Work Plan

Over the 3-year period, there will be 8 meetings, though some will be face-to-face whereas others will be by webex – the WG will only meet by webex in 2020, and will use webex as much as possible to minimise travel.

Meetings will address: a start-up meeting to agree the work plan with roles and responsibilities; annual review and planning meetings at the end of years 1 and 2; interim workshops in years 1, 2 and 3 focussing on specific tasks; a meeting to specifically draft the final report and a final meeting to submit the Final Report.

Subgroups will work on the ToRs between these meetings with regular contact through email and/or webinars. Most of the work regarding deliverables for the different ToRs will be planned and performed in parallel.

All four ToR will be launched at the onset of the working group and be delivered in parallel throughout the three-year term. However, given that ToR D requires expertise on socio-economics that is not within the existing membership but is available through other ICES working groups, we propose to carry out this ToR as a separate workshop under its own resolution in 2021/22.

Supporting information

Priority	The inclusion of sea trout and other diadromous fish in EU policy areas including the CFP and Marine Strategy Framework Directive means that it is important to improve the methods currently available to managers to assess the status of stocks and investigate the effects of management actions. The final report and recommendations will guide both individual countries in making progress on sea trout assessment and management and will steer ICES on the best next steps for sea trout science, assessment and advice.
Resource requirements	The research programmes which provide the main inputs to this group are already underway, and resources are already committed. The additional resource from ICES required to undertake additional activities in the framework of this group is only Secretarial support (see below). A proposal has been submitted for an International Training Network (ITN) of PhDs on subjects contributing to the general aims of the WGTRUTTA and, if successful, this will significantly enhance resourcing of delivery. However, core delivery does not depend on this ITN support.
Participants	The Group is normally attended by some 15-20 members and guests.
Secretariat facilities	Standard support to EG.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	Links to ACOM, FRSG, WGBAST who provide advice on Baltic sea trout, and WGDIAD regarding diadromous fish stocks, life histories, threats and sustainable use of the resource.
Linkages to other committees groups	The activities of this group will take forward the developmental work of WGTRUTTA, testing the implementation of assessment methods, and addressing key knowledge gaps. Links will be fostered with the The Working Group on Cumulative Effects Assessments in Management (WGCEAM). This work will be closely associated with the ICES Ecosystem Observation Steering Group (EOSG) and by incorporating ToR D we will also link with the ICES Human Activities, Pressures and Impacts Steering Group (HAPISG) and any future work of the IEASG-WGSOCIAL. Working Group on Social Indicators.
Linkages to other organizations	Links to the EU Commission and the Data Collection Framework / EU_Multi-annual Plan (MAP), and to the associated InterSessional Sub-Group (ISSG) on Diadromous Species. Links to the EU-funded research projects of SAMARCH (Interreg: France, England); RETROUT (European Regional Developmental Fund); MARGEN II (Interreg: Sweden, Denmark, Norway).

WGWIDE– Working Group on Widely Distributed Stocks

This resolution was approved 3 November 2020

2020/2/FRSG20 The **Working Group on Widely Distributed Stocks (WGWIDE)**, chaired by Andrew Campbell, Ireland, will meet 25–31 August 2021 in ICES HQ in Copenhagen to:

- a) Address generic ToRs for Regional and Species Working Groups.

The assessments will be carried out on the basis of the stock annex. The assessments must be available for audit on the first day of the meeting.

Material and data relevant for the meeting must be available to the group no later than 14 days prior to the starting date.

WGWIDE will report by 8 September 2021 for the attention of ACOM.

Only experts appointed by national Delegates or appointed in consultation with the national Delegates of the expert's country can attend this Expert Group

WKMSSEDEV – Workshop on MSE development

This resolution was approved on the Resolution Forum in September 2019. The meeting was postponed from 2019 to 2020. UPDATE: Meeting postponed till 2021 to ensure a physical meeting can be held (dates tbd).

2019/2/FRSG29 The **Workshop on MSE development (WKMSSEDEV)**, chaired by Daniel Howell*, Norway, will be established and meet from xx-xx Month 2021 at ICES HQ, Copenhagen, Denmark to:

- a) Allow developers to compare the different MSE tools under development in different regions around the world
- b) Identify areas where collaboration between development teams could be beneficial.
- c) Produce a catalogue of different MSE tools available, with the different areas of emphasis described for each.

WKMSSEDEV will report by xx Month 2021 for the attention of FRSG and ACOM.

Supporting information

Priority	The
Scientific justification	<p>Term of Reference a) Multiple tools for conducting Management Strategy Evaluations (MSEs) / Harvest Control Evaluations are in use and under development around the world. However, there is limited visibility of these tools outside their specific geographic area of use. It is likely that this isolation is resulting in much duplication of effort and giving greater possibilities for errors than a more collaborative approach would imply.</p> <p>Term of Reference b) Different MSE tools have been developed with different aims in mind (data rich, data poor, socio-economic,...), but there is limited visibility outside the</p>

	<p>geographic area that these tools have been applied to. Such a catalogue would both enable those contemplating running a MSE to be aware of existing tools that might aid them, and allow developers to identify and contact researchers with experience in specific topics.</p> <p>Term of Reference c)</p> <p>By having the development teams of a range of MSE tools in one place, it will be possible to compare the different tools, and identify the extent to which collaboration is possible. Specifically, the meeting will aim to produce guidelines about a common set of outputs, which would allow for greater transparency between MSE exercises, as well as making reviews easier.</p> <p>Term of Reference d)</p> <p>Produce a short document with MSE design and debugging tips based on the experiences of the MSE developers attending the meeting.</p>
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Resource requirements	The research programs developing these MSE tools are under way, the only requirement is to provide a forum to allow the developers to share experiences
Participants	Those directly involved in developing MSEs.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory committees	This would have an indirect link to ACOM, but there are no obvious direct linkages.
Linkages to other committees or groups	WKG MSE2, Fisheries Resources Steering Group
Linkages to other organizations	This would link to work going in other fisheries institutes and jurisdictions (for example NOAA in the US, UBC in Canada, Maram in South Africa).

WKCOLIAS2 – Second Workshop on Atlantic chub mackerel

This resolution was approved on the Resolution Forum in July 2020

2019/2/FRSG46 The Second Workshop on Atlantic chub mackerel (*Scomber colias*) (WKCOLIAS2) chaired by Cristina Nunes* and Alba Jurado-Ruzafa*, will work by correspondence during 2020 and meet online 25–29 January 2021 to address the following ToRs:

- a) Analyse chub mackerel abundance, distribution and migrations in the Northeast Atlantic waters of Europe and Northwest Africa;
- b) Explore the connectivity between Atlantic chub mackerel in Atlantic and Mediterranean waters.
- c) Analyse the population structure and propose stock units in European Atlantic waters.

WKCOLIAS2 will report by 28 February 2021 for the attention of ACOM.

Supporting information

Priority	High. This workshop will provide ICES with the necessary data and biological knowledge to assess stock status and fishing opportunities for chub mackerel stocks in the northeast Atlantic waters. Further knowledge of the species is essential to progress to multispecies assessments and ecosystem models.
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Scientific justification	Atlantic chub mackerel (<i>Scomber colias</i> Gmelin, 1978) is a middle-sized pelagic fish distributed in warm and temperate northeast Atlantic waters. The bulk of the catches used to take place in north western waters of Africa (CECAF area of competence), with also a rather stable fishery in the Gulf of Cadiz, and also a small one in the inner part of the Bay of Biscay. However, in the last 15 years, landings in both Portuguese waters and in the Cantabrian Sea (ICES Division 9a and 8c) have increased exponentially. Atlantic chub mackerel has become an important resource for the purse seine fishery, partly compensating for the decrease of fishing opportunities for sardine in Iberian waters, the traditional target of the fishery. Yet, the dynamics, stock identity, and stock status of Atlantic chub mackerel in Atlantic European waters, and also the connectivity with the Atlantic African waters populations are unknown. While there are technical management measures at the national level, catches are not limited, and there are concerns about the long-term sustainability of this resource. Atlantic chub mackerel is a key species of the pelagic ecosystem in Atlantic waters and it is very important to improve knowledge on this species and the interactions with other pelagic fish species (e.g., Atlantic mackerel, sardine, anchovy or horse mackerel) in order to improve assessment and management at the multispecies/ecosystem level.
Resource requirements	Atlantic chub mackerel is sampled within the EU Data Collection Framework including the Canary Islands. The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resources required to undertake additional activities (e.g. SharePoint access and ICES Secretariat support) in the framework of this group are negligible.
Participants	The Workshop will be attended by 15–20 members, including experts in bottom trawl and acoustic surveys and stock assessment.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory committees	The Workshop has links to ACOM and SCICOM
Linkages to other committees or groups	Workshop on age estimation of Atlantic chub mackerel otoliths (WKARCM), WGWIDE, WGHANSA, WGBIOP, SIDWG.
Linkages to other organizations	Not applicable.

WKFEA – Workshop on the Future of Eel Advice

This resolution was approved on the Resolution Forum in July 2020

2019/2/FRSG47 Workshop on the future of eel advice (WKFEA) chaired by Estibaliz Diaz*, Spain, and Alain Biseau*, France, will work by correspondence (2 November 2020–29 January 2021) and meet from 1–5 February 2021, Online, to discuss the current advice framework, consider options for future assessment and advice needs and draft a roadmap towards recommendations for a new or adapted advice framework on fishing opportunities and potentially other anthropogenic pressures on European eel. Acknowledging that ICES has provided advice on fishing opportunities and effectiveness of management plans in the past, this WK will provide recommendations for advice and

potential approaches to deliver those recommendations to ICES, GFCM and EIFAAC. To achieve this aim, the WK will address the following ToRs:

- a) Does the current advice include recent methodological advances and current knowledge? Review and discuss the current advice procedure and identify relevant end-users (also other than the EC). Elicit whether the advice complies with the precautionary approach, is based on the best scientific information available, sufficiently supports management decisions, considers all relevant anthropogenic sources of mortality or can be improved in any other way. Identify potential issues that need to be addressed in future advice and define evidential needs (assessment requirements) to support management and recovery of the eel stock.
- b) What are the options for improving the evidence base and adapting advice? Use all available sources of information (WGEEL Database, FAO data, literature, etc.) and consider general concepts for the future assessment and consecutive advice.
- c) Evaluate these concepts in terms of their feasibility, considering e.g. the precautionary approach, the support of management decisions, the advisory framework and data needs. Outline the challenges and opportunities for providing a more operational advice.
- d) Scope the needs for advice and the concepts with the requesters, in order to determine the feasibility for requesters to meet their management objectives.
- e) What is the future of eel assessment and advice? Based on the findings of the above, and where deemed appropriate, draft a roadmap (or roadmaps) towards future advice for the European eel stock (in context of the ecosystem approach). This/These should elaborate the modalities of potential assessment approaches (method, frequency, scale, reference points etc.), customize data needs, define objectives for future work and set a time frame for the completion of these tasks.

To do so, a group of members from WGEEL, including a representative from Norway, GFCM and EIFAAC, in liaison with representation from the European Commission will, work by correspondence to add to the work done during the WGEEL 2019 on the consequences of the precautionary approach on advice for European eel in advance of the WKFEA. The effort required during the work by correspondence will vary, but is expected to be approx. one day per week, including a weekly WebEx.

WKFEA will report by 28 February 2021 for the attention of ACOM.

Supporting information

Priority	High to ICES to provide a roadmap to address limitations of the current advice framework for the European eel.
	ICES should inform of this work with the GFCM and EIFAAC so as to avoid possible overlaps or contradictions with the upcoming GFCM research programme.

Scientific justification	<p>Despite increased efforts to aid the recovery of the European eel stock since the implementation of the “eel regulation” (EU 1100/2007) it remains at a very low level and it is considered outside of safe biological limits according to the latest ICES advice (ICES, 2019).</p> <p>The current advice is, however, almost exclusively based on recruitment time series (lacking meaningful biological reference points for the management of the stock) and could be improved in order to better account for the complex biology, assessment and management of the species. Briefly, there are two levels to be considered: i) the whole (panmictic) stock, which is scattered across Europe and North Africa and ii) the regional level, since there is large variation in vital population characteristics (e.g. growth, sex ratio, age at maturation) as well as fisheries and other anthropogenic sources of mortality (e.g. hydropower) across the distributional range, which consequently need to be accounted for in the assessment and management of the stock.</p> <p>Since large improvements were made in data collection and availability of the European eel stock (which provided towards a pan-European database developed by the WGEEL) it is deemed necessary to review and improve the current advice and advice framework and develop concepts on how to improve it in order to make use of the best scientific knowledge available and provide a more operational advice for managers.</p>
Resource requirements	Secretariat support and meeting facilities at ICES HQ, Copenhagen.
Participants	The participation should reflect the diverse scientific competence needed to fulfil the objectives of the workshop and relevant end-users of the advice. If requests to attend exceed the meeting capacity available, ICES reserves the right to allocate participants based on the experts' relevant qualification with priority to WGEEL members, EIFAAC, and GFCM Working. Participation of stakeholders is not committed.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory committees	The Workshop will have implications in the eel advisory process to be reviewed by ACOM.
Linkages to other committees or groups	The findings will be of direct benefit to the WGEEL, FRSG and wider to WGDIAD.
Linkages to other organizations	The findings will be of direct interest to DG MARE and DG ENVIRONMENT of the European Commission, in relation to the obligations of the Eel Regulation (EC1100/2007) and the EU MAP, and to GFCM and EIFAAC in relation to eel management.

WKSURVIVE –The Workshop on the Inclusion of Discard Survival in Stock Assessments

This resolution was approved on the Resolution Forum in September 2020

2020/2/FRSG50 The **Workshop on the Inclusion of Discard Survival in Stock Assessments** (WKSURVIVE), chaired by Tom Catchpole*, UK, and Fabian Zimmermann*, Norway, will be established and will meet in Copenhagen, Denmark, 9–11 February 2021 (or online if travel is restricted by COVID19 measures) to:

- a) Progress and extend the work of the dissolved ICES WGMEDS (Working Group on Methods to Estimate Discard Survival), initially through a single workshop that aims at assessing the state-of-the-art knowledge and current research needs relating to discard survival, through a collaboration between experts in stock assessment and experts in assessing discard survival.
- b) Explore the feasibility and utility of incorporating new discard survival estimates in stock assessments in principle. This task will include an exchange of knowledge between the two disciplines on the key relevant components of stock assessments and of discard survival evidence in the context of managing stocks and generating stock advice.
- c) Review the various approaches taken to integrate discard estimates in current assessments in the context of applying discard survival estimates.
- d) Present case studies which aim to explore the implications to stock estimates and reference points of introducing discard survival estimates, or potential error caused by using inaccurate discard survival or omitting discarding entirely.
- e) Maintain the work of WGMEDS in developing discard survival assessment methods and to progress our understanding of the factors effecting discard survival. This will include presenting updates on the latest research projects aiming to estimate discard survival, such as the evidence roadmaps associated with specific regulated exemptions from the landing obligation.
- f) Decide whether a new ICES Working Group would receive sufficient support and provide the correct mechanism to progress the objective of utilising discard survival evidence in stock assessments. Outputs of the workshop will include identifying the skills, timelines, and specific terms of reference for a new group if this is the agreed approach. As a basis for this, the tasks proposed by WGMEDS will be discussed:
 1. Develop guidance to assist benchmark workshops and assessment expert groups to determine whether the available survival estimates are sufficiently robust and representative to be utilised.
 2. Develop methods to combine the results of survival studies on a given stock conducted with different gears, seasons, areas and handling methods to derive an overall best survival estimate of discards for the stock.
 3. Propose standard approaches to including discard survival in catch scenarios for different assessment types.
 4. Agree methods for presenting discard survival information in the advice sheets for the different ICES stock categories (1-6). This would include the standard terminology to use, formatting of tables and details of the calculations depending on the stock category.

WKSURVIVE will report by 1 March 2021 for the attention of the Fisheries Resources Steering Group and ACOM.

Supporting information

Priority	The current activities of this Group will lead ICES into issues related to the ecosystem affects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very high priority.
Scientific justification	The potential for exemption from the European Union (EU) Common Fisheries Policy's (CFP) landing obligation (discard ban), where high

discard survival can be demonstrated, identified the need for scientific guidelines to conduct discard survival assessments that generate robust estimates.

ICES WGMEDS (2017-2019) set out to review and update ICES guidance on 'Methods to Estimate Discard Survival' and complete meta-analyses of discard survival evidence to investigate variables influencing survival, with a view to influencing survival through modified fishing practices. This supported the work of group members to estimate discard survival in a variety species-fishery combinations, including Nephrops, mackerel, plaice, common sole, eels, rays, much of which has been put forward as evidence to support exemptions from the EU discard ban. There was a high impact of the work produced by the WGMEDS members – specifically with multiple new EU regulated exemptions from the landing obligation. This has permitted fishers to continue discarding defined species under exemption from the discard ban.

Since 2018, deductions from TACs were made based on the estimated survival rate, whereby the estimate of exempted dead discards were deducted from the TAC to reduce the risk of increasing fishing mortality beyond the agreed TAC. However, this meant that because most stock assessments do not account for discard survival, there was the potential for the final TACs agreed to be inconsistent with the ICES advice in terms of overall fishing mortality.

Therefore, future work was viewed as necessary to explore the implications of introducing or excluding discard survival in the assessments, in the context of the advice and TAC setting. This would include developing guidance to assist assessment expert groups to determine whether available survival studies can be utilised. It would require reviewing and assessing the quality and confidence in available discard survival estimates and exploring the potential to combine the results of survival studies so the effect of different variables could be accounted for in estimating an overall best survival estimate. The ultimate outcome could be to include estimates of discard survival in catch scenarios in the ICES advice sheets. To address this the following specific tasks were proposed by WGMEDS:

- a) Develop guidance to assist benchmark workshops and assessment expert groups determine whether the available survival studies for a given stock have been adequately conducted and are sufficiently robust and representative of the fishery to be used in catch scenarios.
- b) Review specific discard survival studies that have not been peer-reviewed and provide comments on their suitability for inclusion in catch scenarios for ICES advice. For example, there are a number of recent studies on Nephrops (Bim, 2017; Albalat et al., 2016) as well as on other stocks that are not used because it is unclear whether they are adequate.
- c) Develop methodology to combine the results of survival studies on a given stock conducted with different gears, seasons, areas and handling methods to derive an overall best survival estimate of discards for the stock.
- d) Propose standard approaches (preferably consistent across multiple stocks and species) to including discard survival in catch scenarios in the advice sheets depending on the ICES stock categories (1-6). The proposals would include the standard terminology to use, formatting of tables and details of the calculations depending on the stock category.

Discussions within WGMEDS concluded that this work was a sufficient departure from WGMEDS that a new group was required, specifically to bring in stock assessment experts. It is proposed that a new group be established that had a combination of stock assessment and discard

	<p>survival evidence expertise and work would be progress by the two disciplines in collaboration.</p> <p>We propose that, initially, one workshop be organised to bring the two disciplines together and agree how this work should be taken forward, for example by establishing a working group or working within the assessment groups, what the terms of reference should be and the level of contribution that could be anticipated to progress the tasks outlined above. This workshop would also be used to maintain momentum from WGMEDES of developing discard survival assessment methods and to progress our understanding of the factors affecting discard survival.</p>
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group would expect to be attended by some 20–25 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory committees	The work of this group will lead to the collection of standardised discard survival data for a number of European fisheries, and inform on the implications for introducing discard survival estimates into stock assessments, therefore it will provide supporting information for the advisory groups.
Linkages to other committees or groups	TBC (for WGMEDES: The activities of this group will be coordinated by SCICOM, through SSGEPI). It will work with WGFTFB, stock assessment WGs and advisory groups utilising data from discard survival assessments.
Linkages to other organizations	The outputs from this group will be of interest to stakeholder Advisory Councils, as well as institutes and organisations in Europe conducting discard survival assessments linked to the Landing Obligation, and relevant institutes in USA, Australia and elsewhere. It will be of particular interest to European fisheries managers to inform on the implications of making TAC deductions associated high survival exemptions.

WKSsalModel - Workshop for salmon life cycle modelling

This resolution was approved on the Resolution Forum in October 2020

2020/22/FRSG51 The **Workshop for Salmon Life Cycle Modelling** (WKSsalModel), co-chaired by Etienne Rivot* (France), Gérald Chaput (Canada) and Dennis Ensing* (UK) will meet online 5–8 January 2021 to:

- a) Advance the Bayesian Life Cycle model for the assessment of North Atlantic salmon (*Salmo salar*);
- b) Train ICES experts in the use of this Life Cycle model, that is currently coded in R and NIMBLE (<https://r-nimble.org/>);
- c) Improve and formalize the workflow from data specification, preparation, and maintenance to the production of the assessment and for provision multiple year forecasts and catch advice;

WKSsalModel will report to ICES WGNAS in March 2021 and by 24 April 2021 for the attention of ACOM.

Supporting information

Priority	<p>This workshop will advance the ability of ICES to assess North Atlantic salmon. The WKSaModel will advance our ability to examine the ecosystem affects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very high priority.</p>
Scientific justification	<p>The WGNAS has developed run reconstruction (PFA) and forecast models of abundance of Atlantic salmon at the stock complex (North America; South Northeast Atlantic, North Northeast Atlantic) and regional scales (for six regions in North America; for 8 jurisdictions in Southern NEAC; for 7 jurisdictions in Northern NEAC) for the provision of ICES catch advice for NASCO and to better understand population dynamics. A new Bayesian Life Cycle model has been proposed to improve the biological realism and to advance exploration of factors that are driving salmon abundance. The Life Cycle model development is led by Etienne Rivot (Institut Agro, France) and several collaborators (Maxime Olmos, Rémi Patin, Pierre-Yves Hervann) using WGNAS data.</p> <p>Following discussions at the WGNAS 2020, and in preparation for a future Benchmark, and the application of the Life Cycle model by the Working Group for the assessment and multi-year catch advice, a workshop of jurisdictional experts and modelers to develop competencies in using the Life Cycle Model and to formalize the workflow of the new modelling framework was recommended to take place in late 2020 or the latest January 2021.</p> <p>Preparation for the workshop</p> <p>Codes for running the model and the workflow (from data to outputs) will be deposited online before the meeting. To maximize meeting efficiency, attendees will have to familiarize with these codes before the meeting, or with examples of the use of r-nimble (https://r-nimble.org/) and shiny (https://shiny.rstudio.com/).</p> <p>Expected outputs from the workshop</p> <ul style="list-style-type: none">• It will contribute to build a shared vision among the WGNAS expert group of the new methodological framework used for providing catch advice based on the life cycle model.• A Working paper describing the Bayesian Life Cycle Model and its application to the development of multi-year catch advice (workflow from data input – model fitting – forecasting) to be presented at the upcoming ICES WGNAS meeting in late March 2021.• .
Resource requirements	<p>The research programmes which provide the main input to this group are already underway, and resources are already committed. The programmes received funding from the Agence Française de la Biodiversité under grant agreement INRAe-AFB SalmoGlob 2016–2018, and from the European Regional Development Fund through the Interreg Channel VA Programme, Project SAMARCH Salmonid Management Round the Channel. The additional resource required to undertake additional activities in the framework of this group is negligible.</p>

Participants	Jurisdiction experts and modelers of the ICES WGNAS Life cycle model experts: Maxime Olmos (UW, Seattle) (to be confirmed), Colin Bull, Rémi Patin, and Pierre-Yves Hervann
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory committees	WGNAS
Linkages to other committees or groups	There is a very close working relationship with all the groups of the Fisheries Technology Committee. It is also very relevant to the Working Group on Ecosystem Effects of Fisheries, the Working Group on Science to Support Conservation, Restoration and Management of Diadromous Species(WGDIAD).
Linkages to other organizations	The work of this group is closely aligned with similar work in FAO and in the Census of Marine Life Programme and responds directly to advice requested by the North Atlantic Salmon Conservation Organisation.

WKNSEA 2021 – Benchmark Workshop for North sea stocks

This resolution was approved on the Resolution Forum in October 2020

2020/2/FRSG52 A **Benchmark Workshop for North Sea stocks** (WKNSea 2021), chaired by ICES Chair Marie Storr-Paulsen* (Denmark), and attended by invited external experts Benoit Berges (The Netherlands), Valerio Bartolino (Sweden) and Larry Alade (USA) will be established and will meet on-line 24–26 November 2020 for a data evaluation meeting and Online, for a 5 day Benchmark meeting 22–26 February 2021 (or virtually if travel is restricted by COVID19 measures) to:

- a) Evaluate the appropriateness of data and methods to determine stock status and investigate methods for short term outlook, taking agreed or proposed management plans into account, for the stocks listed in the text table below. For all these stocks, the evaluation shall include consideration of:
 - i. Stock identity and migration issues (for example, this should take into account the conclusions of WKNSCodID 2020 for cod);
 - ii. Recent and historical life-history data (for example, fluctuations in mean weights at age of sole; potential longer-term changes in spurdog life-history parameters);
 - iii. Current sampling levels and adjust stratification levels for landings and discards accordingly;
 - iv. Examining alternative assessment models to the current model;
 - v. Potential for ensemble modelling to account for structural issues that may not be resolved by a single model;
 - vi. Exploring impact of all tuning fleets and/or other available fishery-independent survey data, on assessment estimates;
 - vii. Further consideration and/or inclusion of environmental drivers, multi-species information, and ecosystem impacts for stock dynamics in the assessments and outlook;
 - viii. Further consideration of mixed fisheries interactions;

- b) Agree and document the preferred method for evaluating stock status and (where applicable) short term forecast and update the stock annex as appropriate. Knowledge about environmental drivers, including multispecies interactions, and ecosystem impacts should be integrated in the methodology where appropriate. If no analytical assessment method can be agreed, then an alternative method (the former method, or following the ICES data-limited stock approach) should be put forward;
- c) Re-examine and update (if necessary) MSY and PA reference points according to ICES guidelines (see Technical document on reference points);
- d) Develop recommendations for future improvements of the assessment methodology and data collection;
- e) As part of the evaluation:
 - i) Conduct a 3-day data evaluation workshop. Stakeholders are invited to contribute data (including data from non-traditional sources) and to contribute to data preparation and evaluation of data quality. As part of the data compilation workshop, consider the quality of data including discards and any estimates of misreported landings;
 - ii) Following the Data Evaluation Workshop, produce working documents to be reviewed during the Benchmark meeting at least 7 days prior to the meeting.

Stocks	Stock leader
cod.27.47d20	Nicola Walker
dgs.27.nea	José de Oliveira
sol.27.7d	Lies Vansteenbrugge
whg.27.6a	Helen Dobby

WKMSYSPICT – Benchmark Workshop on the application of SPiCT to produce MSY advice for selected stocks

This resolution was approved on the Resolution Forum in October 2020

2020/2/FRSG53 The **Benchmark Workshop on the application of SPiCT to produce MSY advice for selected stocks** (WKMSYSPICT), co-chaired by Manuela Azevedo*, Portugal (ICES Chair) and Massimiliano Cardinale*, Sweden (External Chair), and reviewed by Casper Berg (Denmark) and Henning Winker (JRC), will meet by web conference: for two days in October 2020 (26 and 28 October) for model learning sessions with SPiCT developers; 17–19 November 2020 for a data evaluation meeting, and; 15–19 February 2021 for the assessment workshop. WKMSYSPICT will evaluate the appropriateness of data and the use of the Surplus Production in Continuous Time (SPiCT) to provide MSY advice for selected stocks. The specific ToRs for this workshop are:

- a) Collate necessary data and information for the application of SPiCT for the stocks listed in Annex 1 prior to the data evaluation workshop.

- b) Review the available data and make recommendations on the most appropriate series to be used for SPiCT and potential improvements to eliminate biases.
- c) Apply the SPiCT methodology and determine the appropriateness of the data and the methodology to determine stock status for each of the stocks listed using the guidance developed following WKLIFEVII, WKLIFEVIII and WKLIFEIX.
- d) For stocks where the methodology is appropriate, determine the methods to derive the parameters for the catch forecast using the harvest control rule for providing MSY advice using SPiCT.
- e) Prepare the stock annex for those stocks where SPiCT is considered appropriate for providing MSY advice
- f) Develop recommendations for improving the guidance and training for the application of SPiCT and for deriving MSY advice.

The Benchmark Workshop will report by 5 March 2021 for the attention of ACOM.

Supporting Information

Priority:	Very high. ICES provides advice on more than 260 stocks and more than 60% of these stocks are in categories 3-6 where currently MSY advice is not provided. With the development of approaches to provide MSY advice for category 3-4, it is imperative that these approaches be implemented as soon as possible.
Scientific justification and relation to action plan:	<p>Following on a request from the European Commission through DG MARE, to improve the scientific assessment of some category 3-6 stocks, ICES has held a series of workshops (WKLIFE) to develop methodologies that would allow to provide MSY advice (see WKLIFEIX).</p> <p>Currently, ICES provides advice for category 3-6 stocks with the precautionary approach. To provide MSY advice for many of these stocks, ICES through WKLIFEVII, WKLIFEVIII and WKLIFEIX has developed a coherent framework for category 3-4 stocks where available data would permit the use of SPiCT .</p> <p>The purpose of the workshop is to conduct a benchmark peer review of the application of the SPiCT approach to provide MSY advice for selected stocks. The selected stocks to be considered in this benchmark was determined based on the availability of appropriate data and capacity.</p> <p>In addition to producing the Stock Annex for stocks where the method is appropriate, the workshop will serve to provide recommendations to improve the guidance for the method as well as potential training.</p>

Annex 1 – List of ICES stocks to be examined during WKMSYSPiCT (Note: the list may change after the method learning sessions in October 2020)

ICES stock code	ICES stock name
Lez.27.6b	Megrim (<i>Lepidorhombus</i> spp.) in Division 6.b (Rockall)

ank.27.8c9a	Black-bellied anglerfish (<i>Lophius budegassa</i>) in divisions 8.c and 9.a
Cod.27.7a	Cod (<i>Gadus morhua</i>) in Division 7.a (Irish Sea)
dab.27.3a4	Dab (<i>Limanda limanda</i>) in Subarea 4 and Division 3.a
fle.27.3a4	Flounder (<i>Platichthys flesus</i>) in Subarea 4 and Division 3.a
nep.fu.25	Norway lobster (<i>Nephrops norvegicus</i>) in Division 8.c, Functional Unit 25 (southern Bay of Biscay and northern Galicia)
nep.fu.2627	Norway lobster (<i>Nephrops norvegicus</i>) in Division 9.a, functional units 26–27 (Atlantic Iberian waters East, western Galicia, and northern Portugal)
nep.fu.2829	Norway lobster (<i>Nephrops norvegicus</i>) in Division 9.a, Functional Units 28-29 (Atlantic Iberian waters East and southwestern and southern Portugal)
nep.fu.31	Norway lobster (<i>Nephrops norvegicus</i>) in Division 8.c, Functional Unit 31 (southern Bay of Biscay and Cantabrian Sea)
pol.27.89a	Pollack (<i>Pollachius pollachius</i>) in Subarea 8 and Division 9.a (Bay of Biscay and Atlantic Iberian waters)
sol.27.8c9a	Sole (<i>Solea solea</i>) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)
usk.27.1-2	Tusk (<i>Brosme brosme</i>) in subareas 1 and 2
usk.27.3a45b6a7-912b	Tusk (<i>Brosme brosme</i>) in subareas 4 and 7-9, and in divisions 3.a, 5.b, 6.a, and 12.b

WKTADSA – Workshop on tools and development of stock assessment models using a4a and stock synthesis

This resolution was approved on the Resolution Forum in October 2020

2020/2/FRSG54 The **Workshop on tools and development of stock assessment models using a4a and stock synthesis (WKTADSA)** chaired by Lisa Readdy* (UK) with Invited Experts Colin Millar (ICES) and Vladlena Gertseva (USA) will meet 16–20 November 2020 and 18–24 January 2021 by web conference to address the objectives below:

The purpose of this workshop is to provide an opportunity for ICES stock assessors working with Stock Synthesis (SS) and Assessment 4 All (a4a) to work closely with method development experts to advance ICES stock assessments. Participants are encouraged to bring forth stock assessment test cases on which they are working, whether they are in an exploratory or advanced stage of development. WKTADSA will:

- a) Provide an overview of SS and a4a and the features of these packages that allow them to apply to a range of stocks and data scenarios.
- b) Direct participants to key resources (peer-reviewed publications, user guides, complementary tools, etc.) that support the development of stock assessments based on SS and a4a.
- c) Provide demonstrations of stock assessments built with SS and a4a, beginning with input data formatting, model decision-making and configuration, to processing, interpretation, and communication of results.
- d) Provide expert feedback, and assistance in developing robust and appropriate models to selected ICES stocks in anticipation of a future benchmark.

WKTADSA will report by 11 February 2021 for the attention of the Fisheries Resources Steering Group and ACOM.

Supporting information

Priority	The WKTADSA will ensure that ICES can use the best available scientific information and tools to provide advice for the stocks considered in this workshop. Consequently, these activities are considered to have a very high priority.			
Scientific justification	There are at least two ICES stocks for which new assessment models are in an advanced stage of development (SS model for mon.27.78abd and a4a model for meg.27.7b-k8ad (WGBIE, 2020)). There are also a number of other stocks, with similar biological characteristics and similar data availability (e.g. ank.27.78abd, meg.27.8c9a, ldb.27.8c9a, ank.27.8c9a), to which very similar models could be applied. The Gadget assessment model of hke.27.8c9a was rejected in 2020 and the stock is now assessed as a category 3. The Northern hake stock, hke.27.3a46-8abd, is assessed using Stock Synthesis and ICES (WGBIE, 2020) considered it was appropriate to test the suitability of the method to assess the hke.27.8c9a. Furthermore, some convergence issues have been detected in the assessment of hke.27.3a46-8abd stock that need to be investigated. The above issues will be explored by inter-sessional subgroup sessions and the final WKTADSA meeting will provide valuable training and support to stock assessors in the development and application of these alternative stock assessment models.			
	Stock code	Stock name	WKTADSA model	ICES WG
	mon.27.78abd	White anglerfish (<i>Lophius piscatorius</i>) in Subarea 7 and divisions 8.a-b and 8.d (Celtic Seas, Bay of Biscay)	a4a	WGBIE
	mon.27.8c9a	White anglerfish (<i>Lophius piscatorius</i>) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)	SS	WGBIE
	meg.27.7b-k8ad	Megrim (<i>Lepidorhombus whiffiagonis</i>) in divisions 7.b-k, 8.a-b, and 8.d (west and southwest of Ireland, Bay of Biscay)	Bayesian statistical catch at age	WGBIE
	ank.27.78abd	Black-bellied anglerfish (<i>Lophius budegassa</i>) in Subarea 7 and divisions 8.a-b and 8.d (Celtic Seas, Bay of Biscay)	Data-limited	WGBIE
	meg.27.8c9a	Megrim (<i>Lepidorhombus whiffiagonis</i>) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)	XSA	WGBIE
	ldb.27.8c9a	Four-spot megrim (<i>Lepidorhombus boscii</i>) in divisions 8.c and 9.a (southern Bay of Biscay and Atlantic Iberian waters East)	XSA	WGBIE
	ank.27.8c9a	Black-bellied anglerfish (<i>Lophius budegassa</i>) in divisions 8.c and 9.a (Cantabrian Sea, Atlantic Iberian waters)	SPiCT	WGBIE
	hke.27.8c9a	Hake (<i>Merluccius merluccius</i>) in divisions 8.c and 9.a, Southern stock (Cantabrian Sea and Atlantic Iberian waters)	Data-limited / GADGET*	WGBIE

	hke.27.3a46-8abd	Hake (<i>Merluccius merluccius</i>) in subareas 4, 6, and 7, and divisions 3.a, 8.a-b, and 8.d, Northern stock (Greater North Sea, Celtic Seas, and the northern Bay of Biscay)	SS	WGBIE
	pil.27.8c9a	Sardine (<i>Sardina pilchardus</i>) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)	SS	WGHANSA
Resource requirements	All the preparatory work will be developed by web conferences			
Participants	6 to 10 participants, 2 invited experts, 1 chair			
Secretariat facilities	Meeting facilities and support for the final meeting			
Financial	None			
Linkages to advisory committees	FRSG, ACOM			
Linkages to other committees or groups	There is a very close working relationship with other assessment working groups and WGMIXFISH-ADVICE.			
Linkages to other organizations	None			

WKFO – Workshop on future of Fisheries Overviews

This resolution was approved 3 November 2020. Meeting dates updated 10 December 2020

2020/2/FRSG55 **Workshop on future of Fisheries Overviews (WKFO)** chaired by Bjarte Bogstad*, Norway, and Youen Vermard*, France, will be established and will meet by correspondence 29–31 March 2021 to:

- a) Discuss and analyse feedback obtained on ICES Fisheries Overviews (FOs) during MIRIA and MIACO 2021 meetings to further develop FOs to meet the current and emerging management needs.
- b) Propose a long-term strategy for FOs by focusing on purpose, links with other advisory products and management needs. Propose a plan for the main steps (potentially incl. future of WKFFO or establishment of permanent EG), and allocate responsibilities to secure long-term viability of the production process.
- c) Suggest revisions in the content/arrangement of FOs, based on the long-term strategy and input from advice requesters and stakeholders. Identify new items to be incorporated to FOs and relevant Expert Groups responsible for these items.
- d) In collaboration with the ICES Data Centre, identify data to be used in FOs to be secured and to conform to the FAIR principles.

WKFFO will report by end of April for the attention of ACOM.

Supporting information

Priority	High priority. Fisheries Overviews (FOs) are part of the recurrent advice in the Administrative Agreement signed between the EU and ICES, and key mechanism for ICES to deliver its advice on ecosystem based management.
Scientific justification	By the end 2020, FOs will be available for most ecoregions. Arranging a dedicated workshop to discuss future of FOs is therefore very timely, including: i) suggesting revisions in the content/arrangement, ii) identifying new products with proposing a process on how to include them to FOs, iii) securing long-term viability of the production process, and iv) securing that the data used will conform to the FAIR principles.
Resource requirements	The national monitoring and research programmes, and ICES EGs which provide the main input to this group are already underway, and resources are already committed.
Participants	The WK will be attended by experts contributing to FOs, include on mixed fisheries, as well as ACOM members responsible for delivery of FOS for particular ecoregions. Input from stakeholders and recipients of advice will be sought during MIRIA and MIACO 2021 meetings.
Secretariat facilities	Setting up webex calls.
Financial	No financial implications.
Linkages to advisory committees	Direct link to ACOM.
Linkages to other committees or groups	AFWG, HAWG, NWWG, NIPAG, WGWIDE, WGBAST, WGBFAS, WGNSSK, WGCSE, WGDEEP, WGBIE, WGEEL, WGEF, WGHANSA, WGNAS, WGMIXFISH, WGBYC
Linkages to other organizations	OSPAR, HELCOM, NEAFC, RAC's etc.

IBPSprat – Inter-benchmark to revise the advice framework for the Sprat stock in 7.de based on the most recent changes to data-limited short-lived species assessments

This resolution was approved on the Resolution Forum in December 2020

2020/2/FRSG56 **The Inter-benchmark to revise the advice framework for the sprat stock in 7.de based on the most recent changes to data-limited short-lived species assessments (IBPSprat)**, chaired by Jonathan White*, Ireland, and reviewed by Andres Uriate, Spain and Pia Schuchert, UK, will meet online from the 2–4 February 2021.

The inter-benchmark will clarify the application of the latest advice for category 3 short-lived species following the conclusion of WKDLSSLS 2020 (working group for data-limited stocks of short-lived species) to the Sprat 27.7de stock.

- a) Review the conclusions of WKDLSSLS for implementation in ICES advice for short-lived category 3 stocks;
- b) Review and calculate the options for providing advice, using the conclusions from WKDLSSLS 2020 for sprat 27.7de.

Supporting information

Priority	Advice for category 3 stocks was updated in 2019 by WKDLSSLS 2019 and WKLIFE 2019, as it was determined that the previous 2 over 3 rule was not satisfactory for short-lived species. While accepting that a move to the proposed over 2 was needed, issues regarding the implantation to annual advice as given Sprat 27.7de remained. These will be clarified at WKDLSSLS 2020. There is a pressing need to implement the updated guidance for this stock in time for
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	HAWG 2021 so sensible advice can be given for this stock in line with ICES guidelines.
Scientific justification	WKDLSSL 2019 has determined that the 1 over 2 rule for advice better reflects the life history of short-lived species and avoids the disconnect in advice given using fish no longer present in the population when utilising a 2 over 3 rule.
Resource requirements	The inter benchmark will be carried out online, due to the ongoing COVID-19 pandemic
Participants	Scientists with expertise in data limited assessment and short-lived species will be required.
Secretariat facilities:	None
Financial implications	No financial implications
Linkages to advisory committees	The results of this work will feed in directly in the ICES advisory process.
Linkages to other committees or groups	This workshop is relevant to: WGHANSA that assesses a number of data limited short-lived species.
Linkages to other organizations	

Defer for further discussion and post-revision on Resolutions Forum for approval (to be addressed by SG Chair, EG Chair, ACOM or SCICOM chair and Secretariat)

WKREPTAF – Workshop on TAF reporting

This resolution was approved 3 November 2020

2020/2/FRSG57 **The Workshop on TAF reporting** (WKREPTAF), chaired by Niels Hintzen* (The Netherlands), will meet online 11–12 January 2021:

- a) to share experiences from experts familiar with TAF and highlight obstacles in operating TAF to provide guidance for the development of TAF
- b) to inventory and demonstrate the features within TAF for writing reports
- c) to create a list of requirements of procedures within expert groups that could be improved in order to save time (i.e. for the reporting)
- d) define and describe required assessment outputs need from TAF, to demonstrate and learn from working examples
- e) to develop a reporting template for the report using TAF (not technical)

WKREPTAF will report to ACOM by 12 February 2021

Supporting information

Priority	High. At March 2020 ACOM, frustration was voiced about the failure to reform the modus operandi and reporting of working groups. A number of expert groups are now using the Transparent Assessment Framework (TAF), and R markdown scripts (and GitHub) to compile their reporting but then transfer these reports into word documents. This is very ineffective and inefficient. Experts are becoming increasingly frustrated by the failure of our reporting system to adapt.
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There is a perception that reporting requirements never change, however ACOM underlines the need for an adaptive reporting making use of new tools. There is currently a large amount of time being spent by experts formatting tables and figures for inclusion in the reports, which are held in TAF, SAG or SID and thus these efforts can be used elsewhere. In addition the place of record (for time series and recording of the methods for construction and assumptions of time series) should be the stock annexes and the databases and not the annual WG report.

TAF training courses have now occurred in almost all regions of the ICES area (not NWWG and AFWG). A large number of stock assessments are now loaded into TAF. The summary graphics for the fisheries overviews are also now available through TAF.

Some chapters of reports are being written directly into word. Some are being prepared using R markdown scripts and then transferred. Some experts are using other means. Large parts of the report are replications of data and graphics that become available online. Even if the reports are not rendered to html, the reports can be based around links to TAF, SAG and SID.

Reports need to:

- Set the context of the analysis, fish, fisheries and management
- Show explorations of the models and data
- Explain decisions made
- Put the findings into the context of fish, fisheries and fisheries management
- Provide other insights from the expert group
- Potentially include mixed fisheries considerations
- Provide recommendations as appropriate
- Confirm that audits and quality checks took place

Much of the reporting in early parts of each chapter explains how time series were constructed (e.g. catches, maturity, weights at age). This information must not be lost. Shifting to html and the availability of documentation schemes, such as Roxygen, means that tables of time series of data created in TAF can be annotated to show rationale and changes in the construction of time series.

Scientific justification	Since ICES advice should be based on quality assured data and methods that are published and understandable, it is obvious that the scientific justification for this work is clear. It is likely that advice in the near future will be web-based (see VISA project) and it is an aspiration that the underlying knowledge base will also be web based. This knowledge base needs to conform to international quality standards. This suggests that ACOM should encourage rendering of advice through html. Services will be offered to export it (such as to pdf).
Resource requirements	Support by ICES secretariat for setting up a virtual meeting
Participants	Scientists with experience and interest in TAF, even if they are not familiar yet with using TAF.

	ACOM members ICES Data Centre
Secretariat facilities	Secretariat administrative and scientific support.
Financial	No extra funding requested
Linkages to advisory committees	The results of this work will feed in directly in the ICES expert working groups and the advisory process.
Linkages to other committees or groups	
Linkages to other organizations	

WKBarFar 2021 – Benchmark Workshop for Barents Sea and Faroese Stocks

This resolution was approved on the Resolutions Forum in November 2020

2020/2/FRSG58 A **Benchmark Workshop for Barents Sea and Faroese Stocks**, chaired by ICES chair **Daniel Howell, Norway**, and attended by three invited external experts George Rose, Canada, Noel Cadigan, Canada and Bjarki Thor Elvarsson, Iceland, will be established and will meet Online for a five-day data evaluation workshop 30 November–4 December 2020 and Online for a five-day Benchmark workshop 1–5 February 2021 to:

- a) Evaluate the appropriateness of data and methods to determine stock status and investigate methods for short term outlook taking agreed or proposed management plans into account for the stocks listed in the text table below. The evaluation shall include consideration of:
 - i. Stock identity and migration issues;
 - ii. Life-history data;
 - iii. Fishery-dependent and fishery-independent data;
 - iv. Further inclusion of environmental drivers, multispecies information, and ecosystem impacts for stock dynamics in the assessments and outlook
- b) Agree and document the preferred method for evaluating stock status and (where applicable) short-term forecast and update the stock annex as appropriate. Knowledge about environmental drivers, including multispecies interactions, and ecosystem impacts should be integrated in the methodology. A full suite of diagnostics (regarding data, retrospective behaviour, model fit etc.) should be examined as a whole to evaluate the appropriateness of any model developed and proposed for use in generating advice.
If no analytical assessment method can be agreed, then an alternative method (the former method, or following the ICES data-limited stock approach) should be put forward;
- c) Evaluate the possible implications for biological reference points, when new standard analyses methods are proposed. Propose new MSY reference points taking into account the WKFRAME results and the introduction to the ICES advice ([section 1.2](#)).
- d) Draft Stocks annexes as part of the benchmark outcomes.

- e) Develop recommendations for future improving of the assessment methodology and data collection;
- f) As part of the evaluation:
 - i) Conduct a 5 day data compilation workshop (DCWK). Stakeholders are invited to contribute data (including data from non-traditional sources) and to contribute to data preparation and evaluation of data quality. Data, particularly catch information, should be collated as far back in time as possible. As part of the data compilation workshop consider the quality of data including discard and estimates;
 - ii) Following the DCWK, produce working documents to be reviewed during the Benchmark workshop at least 7 days prior to the workshop.

Stock	Assessment Lead
Cod.27.1-2: Cod (<i>Gadus morhua</i>) in subareas 1 and 2 (Northeast Arctic)	Yuri Kovalev, Russia and Bjarte Bogstad, Norway
Cod.27.1-2coast: Cod (<i>Gadus morhua</i>) in subareas 1 and 2 (Norwegian coastal waters cod)	Asgeir Aglen, Norway
Ling.27.5b: Ling (<i>Molva molva</i>) in Division 5.b (Faroes grounds)	Lise Helen Ofstad, Faroe Islands

The Benchmark Workshop will report by 1 April 2021 for the attention of ACOM.

WKWEST 2020 – Benchmark Workshop on selected stocks in the Western Waters

This resolution was approved on the Resolutions Forum in November 2020

2020/2/FRSG59 **A Benchmark Workshop on selected stocks in the Western Waters in 2021 (WKWEST)**, chaired by External Chair Arved Staby (Norway) and ICES Chair Mathieu Lundy, and attended by two invited external experts Diana Gonzales (Spain), Marta Quinzan (Spain) and tbc. will be established and will meet in via web conference 1–4 December 2020 for a data evaluation meeting and at ICES HQ, Copenhagen, Denmark, for a 5 day Benchmark meeting 22–26 February 2021 (or virtually if travel is restricted by COVID19 measures) to:

- a) Evaluate the appropriateness of data and methods to determine stock status and investigate methods for short term outlook, taking agreed or proposed management plans into account, for the stocks listed in the text table below. For all these stocks, the evaluation shall include consideration of:
 - i. Stock identity and migration issues;
 - ii. Recent and historical life-history data);
 - iii. Current sampling levels and adjust stratification levels for landings and discards accordingly;
 - iv. Examining alternative assessment models to the current model including a wide range of model diagnostics.;
 - v. Exploring impact of all tuning fleets and/or other available fishery-independent survey data, on assessment estimates;
- b) Agree and document the preferred method for evaluating stock status and (where applicable) short term forecast and update the stock annex as appropriate. Knowledge about environmental drivers, including multispecies

interactions, and ecosystem impacts should be integrated in the methodology where appropriate. If no analytical assessment method can be agreed, then an alternative method (the former method, or following the ICES data-limited stock approach) should be put forward;

- c) Re-examine and update (if necessary) MSY and PA reference points according to ICES guidelines (see Technical document on reference points);
- d) Develop recommendations for future improvements of the assessment methodology and data collection;
- f) As part of the evaluation:
 - i) Conduct a 3-day data evaluation workshop. Stakeholders are invited to contribute data (including data from non-traditional sources) and to contribute to data preparation and evaluation of data quality. As part of the data compilation workshop, consider the quality of data including discards and any estimates of misreported landings;
 - ii) Following the Data Evaluation Workshop, produce working documents to be reviewed during the Benchmark meeting at least 7 days prior to the meeting.

Stocks	Stock leader
pil.27.7	Rosana Ourens
pol.27.67	Katie Holmes
gur.27.3-8	Neil Campbell
ple.27.7h-k	Claire Moore
sol.27.8c9a	Maria Garzia Pennino

The Benchmark Workshop will report by 19 March 2021 for the attention of ACOM.

WKWHMRP – The Workshop for the review of the on the assessment of a new rebuilding plan for Western Horse Mackerel (WKWHMRP)

This resolution was approved on the Resolutions Forum in January 2021

2020/2/FRSG60 **The Workshop for the review of the on the assessment of a new rebuilding plan for Western Horse Mackerel (WKWHMRP)** chaired by Einar Hjörleifsson, Iceland, and reviewed by Allen R. Kronlund, Canada, and Jonathan Deroba, USA, will be established and will meet online 5 February and 29 March 2021 to:

- a) Review the approach (i.e. analytical methods, application and interpretation) described in the Pelagic Advisory Council (PelAC) report (listed below) for the evaluation of the proposed Harvest Control Rule (HCR) in the rebuilding plan. The review should consider:
 - i) Whether the tools used (methods), and the model conditioning done (data), are appropriate for the stock;
 - ii) Whether the minimum requirements for simulation testing HCRs, as developed by WKG MSE process, are met;

- iii) The appropriateness of the criteria used to draw conclusions on the performance of the HCRs
- b) On the basis of (a), determine whether the HCR evaluations presented in the PELAC are sufficient to evaluate the proposed rebuilding plan against precautionary criteria and the rebuilding plan targets and measures detailed in Article 5 of the proposed rebuilding plan.
- c) Depending on the outcome of (b), either:
 - i) analyse the results of the HCR evaluation, and develop conclusions on whether the proposed rebuilding plan can be considered precautionary and be used as the basis for ICES fishing opportunity advice for the stock; **or**
 - ii) Propose additional analyses or diagnostics that would allow for sufficient evaluation of the proposed plan
- d) Should the proposed plan include elements that are in contradiction with ensuring that the stock is fished and maintained, also in the future, at levels which can produce MSY, comment specifically on such elements, and their consequences for ensuring MSY.
- e) Deliver a report containing the key decisions and conclusions in relation to the TORs.

The three independent external reviewers will also conduct additional scientific review.

The report detailing the evaluation and proposal of parameters for the HCR for the Western horse mackerel rebuilding plan is:

Pastors, M.A., Campbell, A., Trijoulet, V., Skagen, D., Gras, M., Lambert, G.I., Sparrevoth, C.R., and Mackinson, S. 2020. Report on Western Horse Mackerel Technical Focus Group On Harvest Control Rule Evaluations 2020. Report for Pelagic Advisory Council.
<https://community.ices.dk/admin/Requests/2020eudgmare2007whm/Shared%20Documents/PELAC%20WHOM%20FG%20report%20on%20Western%20Horse%20Mackerel.pdf>

The proposed rebuilding plan is detailed in:

PELAC proposal for a rebuilding plan for Western horse mackerel.
<https://community.ices.dk/admin/Requests/2020eudgmare2007whm/Shared%20Documents/1920PAC86%20Annex%201%20PELAC%20rebuilding%20plan%20WHOM.pdf>

WKWHMRP will report by 16 February 2021 for the attention of the Advisory Committee.

Supporting information

Priority	High.
Scientific justification	ICES received a request from the EU to evaluate the proposal for a rebuilding plan for Western Horse Mackerel as prepared by the Pelagic Advisory Council in July 2020. This request requires a review of (a) the methods used to evaluate the proposed HCR and (b) whether the proposed rebuilding plan can be considered appropriate
Resource requirements	This work will require access to the ICES SharePoint and web conference facilities.

Participants	Open to scientific experts in the ICES community as well as stakeholders and observers.
Secretariat facilities	Support to provide access to the SharePoint and formatting the report.
Financial	A budget has been agreed with EU.
Linkages to advisory committees	ACOM
Linkages to other committees or groups	WGWIDE, WKG MSE series, WKREBUILD series
Linkages to other organizations	Pelagic Advisory Council

WKICECOD 2021 – Workshop on the re-evaluation of management plan for the Icelandic cod stock

This resolution was approved on the Resolution Forum in February 2021

2021/2/FRSG61 **The workshop on the re-evaluation of management plan for the Icelandic cod stock (WKICECOD)** will meet online on 25 February 2021 and 2–3 March 2021 chaired by external chair Bjarte Bogstad (Norway), and reviewed by Margarita Rincón Hidalgo (Spain) and Malcolm Haddon (Australia), to evaluate the updated operational assessment model and harvest control rule evaluations for Icelandic cod (cod.27.5a). The work will be to:

- a) Evaluate the appropriateness of data and methods to determine stock status and investigate methods for short term outlook taking agreed or proposed management plans into account for the stocks listed in the text table below. The evaluation shall include consideration of (where applicable):
 - i. Stock identity and migration issues;
 - ii. Life-history data;
 - iii. Fishery-dependent and fishery-independent data;
 - iv. Further inclusion of environmental drivers, multi-species information, and ecosystem impacts for stock dynamics in the assessments and outlook
- b) Agree and document the preferred method for evaluating stock status and (where applicable) short term forecast and update the stock annex as appropriate. Knowledge about environmental drivers, including multispecies interactions, and ecosystem impacts should be integrated in the methodology. If no analytical assessment method can be agreed, then an alternative method (the former method, or following the ICES data-limited stock approach) should be put forward;
- c) Re-examine and update (if necessary) MSY and PA reference points according to ICES guidelines (see Technical document on reference points);
- d) Evaluate the proposed Harvest Control Rule(s) for the Icelandic cod management plan against its objectives and develop conclusions on whether the proposed HCR(s) can be considered precautionary and be used as the basis for ICES fishing opportunity advice for the stock.

Stock	Stock leader
cod.27.5a	Einar Hjörleifsson <einar.hjorleifsson@hafogvatn.is>

WKICECOD will report by 23 March 2021 for the attention of the Advisory Committee.

Supporting Information

Priority:	High
Scientific justification and relation to action plan:	The Ministry of Industries and Innovation in Iceland has confirmed the adoption of the current management plans for Icelandic haddock and saithe for the period of 5 years , but require an independent review of the analyses done.
Resource requirements:	Work to be conducted by national experts in Iceland.
Participants:	National experts from Iceland and NWWG members
Secretariat facilities:	SharePoint site and meeting room for the workshop in March.
Financial:	
Linkages to advisory committees:	Reports to ACOM
Linkages to other committees or groups:	NWWG
Linkages to other organizations:	

WKEELDATA 3 – The third Workshop on designing eel data call

This resolution was approved on the Resolution Forum in March 2021

2021/2/FRSG62 A **Workshop on Designing an Eel Data Call (WKEELDATA3)**, chaired by Alan Walker (UK) and Ciara O’Leary (Ireland), will meet virtually, 19 April–23 April to design a data call to all ICES/EIFAAC/GFCM countries having natural production of European eel and prepare their integration of data in the eel database supporting WGEEL work. The data call 2021 will request the same data as every year (e.g. the 2020 call) but also various extra stock indicators (B_0 , B_{best} , $B_{current}$, ΣA , ΣH and ΣF) reported by EU countries and others every three years to the WGEEL and to the EC in the context of the Council Regulation (EC) No 1100/2007. To achieve this aim, the WK will:

- a) Prepare templates that will be used to report these data to the ICES and text for the 2021 ICES Data call on eel;
- b) Develop in the WGEEL’s shiny application, the tools required for the automatic generation of templates for the integration of reported data in the database and for their analysis;
- c) Run tests with dummy data to validate the spreadsheets, data integration procedures and debug the shiny application.

WKEELDATA3 will report by 7th May 2020 for the attention of FSRG, WGEEL, WGDIAD, ACOM, SCICOM, EIFAAC, GFCM. The WK will require post-meeting work of estimated 15 man-days to run betatests to validate the developments, which will be distributed among WK members.

Supporting information

Priority	This topic is a high priority for ICES recurrent eel advice. For the countries/institutions (EIFAAC, GFCM) supporting the work of the WGEEL, the present data collection procedures are complex and require a large resource in staff time shortened by this workshop, and it will facilitate the future benchmarking of the stock assessment process to support the ICES Advice as will be proposed to ACOM by WKFEA.
Scientific justification	The WGEEL annually collates data on recruitment, landings from commercial and recreational fisheries, restocking, aquaculture production, rates of other human-induced mortalities on eels, biological characteristics of eels, etc. The development of various tools (database, standardised templates, shiny application for data integration and analysis) have allowed to greatly improve consistency in the data collection and to facilitate their use in the stock assessment process. In addition to this yearly data call, WGEEL collects every three years various indicators on mortalities and silver eel biomass indicators that are reported by Member States to the EU. Since these additional data will be collected in 2021, the tools must be adapted to manage this specific type of data, addressing issues that emerged during the last collection of these data in 2018.
Resource requirements	The workshop will be run virtually. Videoconferencing system and sharepoint will be required.
Participants	WGEEL members in charge of the data collection and management. One or two persons in charge of answering to the data call.

Secretariat facilities	The standard support for arranging the meeting, providing access to sharepoint, videoconferencing system and for formatting the report.
Financial	No financial implications.
Linkages to advisory committees	Links to ACOM as the data collection and related procedures are crucial for the work of WGEEL, providing the scientific basis for the ICES advice on fishing opportunities published by ACOM.
Linkages to other committees or groups	The results will be of direct benefit to the WGEEL and wider to WGDIAD.
Linkages to other organizations	The results will be of direct interest to DG MARE of the European Commission, in relation to the obligations of the Eel Regulation (EC1100/2007) and the EU MAP, and to GFCM in relation to planned eel Data Collection Framework Reference.

WKSARHCR – The Workshop for the evaluation of the Iberian sardine HCR

This resolution was approved on the Resolution Forum in April 2021

2021/2/FRSG63 **The Workshop for the evaluation of the Iberian sardine HCR (WKSARHCR)**, chaired by Manuela Azevedo, Portugal, and reviewed by Martin Dorn, USA, Sonia Sanchez, Spain and Peter Kuriyama, USA, will be established and will meet online on 12 April 2021 and 27–30 April 2021 to:

- a) Re-examine and update (if necessary) MSY and PA reference points according to ICES guidelines (see Technical document on reference points);
- b) Evaluate the proposed Harvest Control Rule (HCR) for the Iberian sardine stock (listed in the text table below) against precautionary criteria. The evaluation should consider:
 - i) Whether the tools used (methods), and the model conditioning done (data), are appropriate for the stock;
 - ii) Whether the minimum requirements for simulation testing HCRs, as developed by WKG MSE process, are met;
 - iii) Analysis of the results of the HCR evaluation to develop conclusions on whether the proposed HCR can be considered precautionary;
- c) Should the proposed HCR include elements that are in contradiction with ensuring that the stock is fished and maintained, also in the future, at levels which can produce MSY, comment specifically on such elements, and their consequences for ensuring MSY.
- d) Deliver a report containing the key decisions and conclusions in relation to the TORs.
- e) Produce an initial draft of the advice.

WKSARHCR will report by 5 May 2021 for the attention of the Advisory Committee.

Stock code	Stock	Stock leaders
pil.27.8c9a	Sardine (<i>Sardina pilchardus</i>) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)	Isabel Riveiro isabel.riveiro@ieo.es Laura Wise lwise@ipma.pt

Supporting information

Priority	High.
Scientific justification	ICES received a request from Portugal and Spain to evaluate the proposal for a new HCR in their management plan for Iberian sardine in February 2021.
Resource requirements	This work will require access to the ICES SharePoint and web conference facilities.
Participants	Open to scientific experts in the ICES community as well as stakeholders and observers.
Secretariat facilities	Support to provide access to the SharePoint and formatting the report.
Financial	A budget has been agreed with Portugal and Spain.
Linkages to advisory committees	ACOM
Linkages to other committees or groups	WGHANSA, WKG MSE series, WKREBUILD series
Linkages to other organizations	

IBPNSWhiting – The Inter-Benchmark Protocol of North Sea Whiting

This resolution was approved on the Resolution Forum in April 2021

2021/2/FRSG64 The Inter-Benchmark Protocol of North Sea Whiting, chaired by Timothy Earl, UK and reviewed by Bjarki Elvarsson, Iceland will be established and will meet by correspondence on 6 April 2021 to:

- a) Test the inclusion of newest natural mortality estimates from ICES WGSAM in the assessment;
- b) Determine whether reference points from the current management strategy are still applicable using EqSim. Update the reference points if necessary.

The IBP will report by 23 April for the attention of the ACOM, WGNSSK and WGSAM.

IBPNSHerring – Inter-Benchmark Protocol of North Sea Herring

This resolution was approved on the Resolution Forum in April 2021

2021/2/FRSG65 The Inter-Benchmark Protocol of North Sea Herring, chaired by Ciaran Kelly (Ireland), and reviewed by Alexander Kempf (Germany) and Jim Ianelli (USA) will be established and will meet by correspondence from June 8th-10th 2021 to:

- a) Investigate methods to bring consistency in the scaling of the assessment arising from updates in SMS.
 - i) Evaluate optimal model configuration.

- ii) Investigate the sensitivity of methods and assumptions about M on the assessment of NSAS herring. This includes investigating the assessment profiling method developed at WKPELA2018.
- b) Carry out the 2021 NSAS assessment based on the updated NSAS assessment model.
- c) Update reference points based on the updated NSAS assessment model.

The IBP will report by 10th July for the attention of the ACOM.

WKDLSSLS 3 – The third Workshop on Data-Limited Stocks of Short-Lived Species

This resolution was approved on the Resolution Forum in May 2021

2021/2/FRSG66 The third Workshop on Data-Limited Stocks of Short-Lived Species (WKDLSSLS 3), chaired by Andrés Uriarte (Spain) and Alexandros Kokkalis (Denmark) will meet on-line, from 13 to 17 September 2021, to further develop methods for stock assessment and catch advice for short-lived stocks in categories 3–4, focusing on the provision of advice rules that are within the ICES MSY framework.

On the basis of the outcomes of WKLIFE VII–X (2017–2020), WKSPRAT 2018, WKSPRATMSE 2018, and WKDLSSLS I–II (2019–2020), the following issues should be addressed:

- a) Test different assessment methods for data-limited short-lived species (seasonal SPiCT, depletion models, stage-based biomass models, others) and provide guidelines on the estimation of MSY proxy reference points for category 3–4 short lived species.
 - i) Further work on assessment methods of stock status relative to MSY concept or other reference points either with surplus production models or with simpler analyses of historical catches, the abundance indices, or others.
 - ii) Improved fitting of SPiCT or other surplus production models for different fish and cephalopods case studies stocks accounting for their particular catch and abundance index series.
 - iii) Further testing of SPiCT advice rules for management for short-lived species. Evaluation of the performance of these rules either alone or in combination with uncertainty caps and biomass safeguards.
- b) Further explore the appropriateness of the other management procedures for short-lived species based on direct use of abundance indices (category 3) by means of Long-Term Management Strategy Evaluations (LT-MSE). This will involve:
 - i) Revisiting, if required, the trend-based advice rules proposed in WKDLSSLS I & II, testing alternative applications, such as by shifting the uncertainty cap values in time, or testing optimal uncertainty caps allowing advice to return back up to previous fishing levels, etc.
 - ii) Further work on applying constant or variant harvest rate strategies in time instead of the trend-based rules (aligned with HCR 3.2.2 Catch rule based on applying an Fproxy in WKMSYCat34). Definition of constant harvest rates MSY proxy and how they vary with assumed

catchability and uncertainty of surveys, productivity and life history assumptions and across modelling platforms.

- iii) Further testing of best ways of defining and applying biomass safeguards.
- iv) Testing the effectiveness of the precautionary buffer in mitigating the short-term risks associated with the harvest control rules.
- c) Testing simple dynamic rules which can approach maximum sustainable harvest rates (as in Carruthers *et al.*, 2016 and others).
- d) Review Current ICES technical guidance on advice rules for stocks in Category 3 for short-lived species and drafting for WKLIFE.

WKDLSSLS 3 will report by 15 October 2021 for the attention of ACOM.

WKREF1 – Workshop on ICES reference points

This resolution was approved on the Resolution Forum in June 2021

2021/2/FRSG67 The **Workshop on ICES reference points (WKREF1)** chaired by Massimiliano Cardinale*, Sweden and Henning Winker, Italy* will meet as a hybrid meeting online and in ICES, Denmark, November 2-4 2021 to:

- a) Review the current limit, trigger and target reference point estimation procedures for both biomass and fishing mortality used by ICES, and identify limitations and inconsistencies considering international best practice, the precautionary approach and international policies and legislation.
- b) Evaluate the robustness, consistency and plausibility of limit and target reference points in relation to current ICES Advice Rule in comparison to alternative approaches.
- c) Explore alternative methods that can better account for stock dynamics, biological realism and productivity drivers in reference point estimations under climate and environmental uncertainties.
- d) Consider appropriate methods of propagating model, estimation and process error uncertainties in the estimation of reference points.
- e) Propose candidate methods to address the emerging issues identified under (a) – (d).

WGREF will report by 29 November 2021 for the attention of the ACOM Committee.

Supporting information

Priority	High
Scientific justification	ICES refers to two types of reference points when providing fisheries advice for category 1 stocks: precautionary approach (PA) reference points and maximum sustainable yield (MSY) reference points. The PA reference points are used when assessing the state of stocks and their exploitation relative to the precautionary approach objectives. The MSY reference points used in the advice rule applied by ICES are aimed at producing advice consistent with the objective of achieving MSY.

The PA reference points and the methods for estimating values were developed between 2001 and 2003 leading to the report of the Study Group on Precautionary Reference Points for Advice on Fishery Management in 2003 (ICES, 2003). Subsequently ICES was requested provide advice consistent with the objective of achieving maximum sustainable yield (MSY). The guidance for estimation of MSY reference points has evolved based on the findings of four workshops: WKMSYREF2,(ICES, 2014), WKMSYREF3 (ICES, 2015), WKMSYREF4 (ICES, 2016), WKGME3 (ICES, 2020a) and Rindorf et al. (2017).

Recent ICES workshops (WKREBUILD, WKGME3 and WKRPCHANGE) have discussed and made recommendations related to ICES reference points. The current procedures for estimating reference points are complex and difficult to communicate internally and externally. In recent years a number issues have been identified these include:

- Should the AR be part of the of reference points estimation process? (because it assumes managers will always apply the AR)
- Conceptually Fp05 without the advice rule is more consistent with the previous definition of F_{pa} whereas ACOM decided to use Fp05 with AR as F_{pa} .
- The rationale of capping F_{MSY} and ranges with F_{pa} or Fp05 when also using the AR has been questioned.
- Proximity of B_{lim} and MSY $B_{trigger}$ for some stocks impacting on AR.
- Which is the role of density dependence on reference point estimation.
- The evidence base for B_{lim} in some stocks has been questioned.
- Inconsistency between EQSim and MSEs.
- Inconsistency between how we assess risk in MSEs and reference point estimation.
- Stocks where $F_{lim} < Fp05$ (F_{pa})
- Subjectivity in the definition and use of S-R types for reference point estimation.
- Using segmented regression with a break point at B_{loss} for Type 5 and 6 stocks.
- Unclear guidance for type 3 stocks and type 6 -high F stocks
- Whether all reference points are actually needed. Providing clear explanations what reference points are and how they are generated and what processes are included are important elements of a more consistent communication approach to reference points

A thorough review of ICES reference points is now needed and process for estimating, updating and communicating reference points needs to be re-evaluated in the context of the ICES advice rule and the recurrent advice that is currently been requested.

In relation to ToR b) the investigations should be carried out across stock assessment model platforms and include considerations of ratio-based reference points and implication of the stock recruitment relationship. Also consider the implications of estimating reference points in the context of moving towards potential model ensemble based advice.

Resource requirements One meeting room at ICES HQ with at least one breakout room and facilities for online participation.

Participants	Scientists with experience and interest in reference points definition and estimation procedures from inside and also from outside the ICES area.
Secretariat facilities	Secretariat administrative and scientific support.
Financial	No financial implications.
Linkages to advisory committees	The results of this work will directly feed the ICES advisory process
Linkages to other committees or groups	HAWG, WKG MSE3, WG WIDE, WGBFAS, WGCSE, WGNSSK, NWWG, AFWG, WGHANSA
Linkages to other organizations	All advice recipients having an interest in ICES reference points.

WKREF2 – Workshop on ICES reference points

This resolution was approved on the Resolution Forum in June 2021

2021/2/FRSG68 The **Workshop on guidelines for reference points** (WKREF2) chaired by Colm Lordan*, Ireland and Rishi Sharma*, Italy, will meet as a hybrid meeting online and in ICES, 11-13 January 2022 to:

- a) Review the outcome of the Workshop on ICES reference points (WKREF1).
- b) Based on the outcome of WKREF1, develop best practice guidelines on the estimation of reference points with worked examples.
- c) Develop recommendations for ACOM on a simplified and harmonised set of guidelines for estimating MSY and precautionary reference points applicable in the advice framework across various ICES stock categories.

WGREF2 will report by 15 February 2022 for the attention of the Advisory Committee.

Supporting information

Priority	High
Scientific justification	<p>WKREF1 will propose a range of candidate methods to define and estimate reference points based on best available science which are appropriate to the ICES advisory framework and end user needs. WKREF2 will explore these methods in more detail by applying them to a range of ICES stocks and where possible also simulation testing the methods.</p> <p>Based on these worked examples the WK will make recommendations to ACOM on reference points guidelines.</p> <p>In relation to b) the worked examples will need to be clearly documented in TAF for the community to use in the future.</p>
Resource requirements	One meeting room at ICES HQ with at least one breakout room and facilities for online participation.
Participants	Scientists with experience and interest in reference points definition and estimation procedures from inside and also from outside the ICES area.
Secretariat facilities	Secretariat administrative, scientific and TAF support.
Financial	No financial implications.
Linkages to advisory committees	The results of this work will directly feed the ICES advisory process.
Linkages to other committees or groups	HAWG, WKG MSE3, WG WIDE, WGBFAS, WGCSE, WGNSSK, NWWG, AFWG, WGHANSA

Linkages to other organizations

All advice recipients having an interest in ICES reference points.

IBPGCOD-2 – Inter-Benchmark Process on East and Southwest Greenland Cod 2

This resolution was approved on the Resolution Forum in June 2021

2021/2/FRSG69 An **Inter-Benchmark Process on East and Southwest Greenland Cod 2** (IBPGCOD2), chaired by Christopher Zimmerman*, Germany, and attended by two invited external experts, Anders Nielsen, Denmark, and Rasmus Hedeholm, Greenland, will be established and will meet by correspondence on 12, 16 and 18 of August 2021 to:

- a) evaluate and if necessary revise current assumptions in natural mortality and migration as well as recent information on changes in fishing patterns;
- b) investigate the sources of the larger than acceptable retrospective inconsistencies in F and SSB, this may include model assumptions and qualities of the input data; explore mechanisms to reduce the retrospective inconsistencies with no detriment to other diagnostics of the stock assessment.
- c) agree and document the preferred method for evaluating stock status and short term forecast and update the stock annex as appropriate. If no robust analytical assessment method can be agreed, then propose alternative methods to provide advice including data-limited methods;
- d) update the stock annex as appropriate;
- e) if required re-examine and update MSY and PA reference points according to ICES guidelines (see Technical document on reference points).

Stocks	Stock leader
Cod (<i>Gadus morhua</i>) in ICES Subarea 14 and NAFO Division 1F (East Greenland, Southwest Greenland)	Anja Retzel

The interbenchmark will report by 25 August 2021 for the attention of FRSG and ACOM.

IBPWitch – Inter-benchmark process for witch flounder in the North Sea, Skagerrak, Kattegat, and eastern English Channel

This resolution was approved on the Resolution Forum in July 2021

2020/2/FRSG70 **The Inter-benchmark process for witch flounder in the North Sea, Skagerrak, Kattegat, and eastern English Channel (IBPWitch)**, chaired by Elliot John Brown*, Denmark, and reviewed by XXX, will meet online from the 23–25 August 2021 to:

- a) Develop a robust and reproducible method to calculate a survey index at age (Q1 and Q3).

- b) Review assessment model diagnostics and identify optimum configuration and settings updating the stock annex accordingly. Carry out the 2021 witch assessment based on the updated assessment model.
- c) If required update reference points based on the updated assessment model following the ICES guidelines.

Stocks	Stock leader
Witch (<i>Glyptocephalus cynoglossus</i>) in Subarea 4 and divisions 3.a and 7.d (North Sea, Skagerrak and Kattegat, eastern English Channel)	Alexandros Kokkalis

The IBP will report by 31 August 2021 for the attention of the ACOM.

IBPMIXFISH – Inter–Benchmark Process to evaluate a change in operating model for mixed fishery considerations in the Celtic Sea and North Sea

This resolution was approved on the Resolution Forum in August 2021

2020/2/FRSG71 The **Inter-Benchmark Process to evaluate a change in operating model for mixed fishery considerations in the Celtic Sea and North Sea (IBPMIXFISH)**, chaired by Dorleta Garcia (Spain), and reviewed by Paul Marchal, France, will meet online from the 20-22 September 2021 to:

- a) Evaluate the proposed change in operating model for mixed fishery considerations in the Celtic Sea and North Sea from FCube to FLBEIA, and its appropriateness for providing advice.
- b) Review parametrisation of the new FLBEIA models for each ecoregion. Parameters that need checked include e.g. fleet-aggregated catches versus single stock advice objects.
- c) Check the ability of the FLBEIA model to incorporate the single species advice and its capacity to produce scenarios that provide meaningful mixed fisheries advice. Forecast behaviour should be evaluated in terms of the consistency of historical, intermediate and advice year values by stock (e.g. catches, fishing mortality and SSB), and catches and chocking behaviour by fleet/stock for forecast scenarios.

The IBP will report by 15 October 2021 for the attention of ACOM.

Supporting Information

Table 1. Known differences in model formulation between the currently used FCube model and the proposed FLBEIA model

Aspect	FCube	FLBEIA
Fleet/metier catches and	Age-aggregated catches.	Age-disaggregated catches.

selectivity	Uniform selectivity pattern among all fleet/metier/stock interactions consistent with the single-stock assessment.	Variable selectivity pattern among fleet/metier/stock interactions.
Stock dynamics	Age-based and fixed dynamics.	Age-based, biomass-based, and fixed dynamics. Biomass-based dynamics allows for the incorporation of stocks assessed with surplus production models (e.g. SPiCT)
Catch model	Baranov-type - Linear relationship between effort and fishing mortality (<i>i.e.</i> constant catchability, q)	Cobb-Douglas-type - Non-linear relationship between effort and fishing mortality (<i>i.e.</i> variable catchability, q , with changing X).