Data Science and Technology Steering Group EGs Resolutions

Overview of expert groups transferred to Data Science and Technology Steering Group (DSTSG)

The following expert groups will be parented by the Data Science and Technology Steering Group from 1 January 2021:

GROUP	ACRONYM	CURRENT SG	CHAIR(S)
Working Group on Fisheries Acoustics, Science and Technology	WGFAST	EOSG	J. Michael Jech, USA
Working Group on DATRAS Governance	WGDG	EOSG	Ingeborg de Boois, Netherlands
Working Group on Recreational Fisheries Surveys	WGRFS	EOSG	Kieran Hyder, UK, and Keno Ferter, Norway
Working Group on the Acoustic Trawl Data Portal Governance	WGAcousticGOV	EOSG	Ciaran O'Donnell, Ireland
Working Group on Spatial Fisheries Data Governance	WGSFDGOV	HAPISG	Christian von Dorrien, Germany
Workshop on Acoustic Backscatter Models	WKABM	EOSG	Sven Gastauer, Germany
Working Group on Commercial Catches	WGCATCH	EOSG	Kirsten Birch Håkansson, Denmark, and Estanis Mugerza, Spain
Workshop on Operational Implementation of Stomach Sampling	WKOISS	EOSG	Pierre Cresson, France and Maria Valls, Spain
The Fourth Workshop on Optimization of Biological Sampling	WKBIOPTIM4	EOSG	Gwladys Lambert, UK, Isabella Bitetto, Italy, and Patricia Gonçalves, Portugal
Working Group on SmartDots Governance	WGSMART	EOSG	Julie Coad Davies, Denmark, and Jane Aanestad Godiksen, Norway
Working group on machine learning in marine science	WGMLEARN	EOSG	Ketil Malde, Norway, and Jean-Olivier Irisson, France
Working Group on Technology Integration for Fishery-Dependent Data	WGTIFD	EOSG	Brett Alger, USA, and Lisa Borges, Portugal
Working Group on Atlantic Larval and Egg Surveys	WGALES	EOSG	Patrick Polte, Germany, and Cristina Nunes, Portugal
Working Group on Biological Parameters	WGBIOP	EOSG	Annelie Hilvarsson, Sweden, Maria Cristina Follesa, Italy, and

			Sally Songer, United Kingdom
Working Group on Governance of the Regional Database & Estimation System [1]	WGRDBESGOV	EOSG	David Currie, Ireland, and Katja Ringdahl, Sweden
Working Group on the Governance of Quality Management of Data and Advice	WGQuality	-	David Currie, Ireland
Workshop on Age reading of Sea bass (*Dicentrarchus labrax*) 2	WKARDL2	EOSG	Mary Brown, UK and Valerio Visconti, UK
Workshop on Age estimation of European anchovy (*Engraulis encrasicolus*)	WKARA3	EOSG	Gualtiero Basilone, Italy
Workshop on Estimation of Commercial Catches I – Ratio estimators	WKRATIO	-	Liz Clarke, UK-Scotland, and Laurent Dubroca, France

[1] Steering Committee for the Regional Database and Estimation System (SCRDB) has been renamed Working Group on Governance of the Regional Database & Estimation System (WGRDBESGOV).

Resolutions approved in 2019/2020

Working Group on Fisheries Acoustics, Science and Technology (WGFAST)

2019/FT/EOSG09 A **Working Group on Fisheries Acoustics, Science and Technology (WGFAST)**, chaired by J. Michael Jech*, USA, 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	22 April	Online meeting	Interim report by 22 May 2020 to ACOM-SCICOM	Michael Jech takes over as chair
Year 2021	19-23 April	Online meeting	Interim report by 30 June 2021 to ACOM-SCICOM	
Year 2022	25-28 April	Dakar, Senegal	Final report by 30 June 2022 to ACOM-SCICOM	

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Collate information on acoustic related research and surveys, and interactions with ecosystem and assessment expert groups.	a) Science Requirements b) Advisory Requirements A summary of the information will be presented in the final report	3.1, 3.2, 3.4	3	
b	Review presented recent work within the topics: "Acoustic methods to characterize populations, ecosystems, habitat, and behaviour"; "Acoustic characterization of marine organisms"; and "Emerging technologies, methodologies, and protocols". Provide guidance by identifying: (1) where training opportunities could be developed; and (2) gaps in knowledge and challenges that should be prioritized by the community.	Create a venue for informing the group members on recent activities and seeking input to further development. An overview of the different contributions and guidance will be presented in the annual report	3.3, 4.1, 4.4	1, 2, 3	
c	Organize a conference session on integrating fisheries acoustics with ecosystem assessment		3.1, 3.2, 4.1	2 or 3	

	and monitoring at an international scientific meeting such as ASC.				
d	Develop, and maintain acoustic metadata and data format conventions and coordinate with acoustic survey groups.	Data format conventions for acoustic metadata and data are required for efficient data interchange and processing of acoustic data, but are lacking in the fisheries acoustics field. CRR 341 (2018) and SISP 4 (2016) have partially addressed this need, but further types of data and acoustic equipment need to be supported.	3.2, 3.5, 4.2	1, 2, 3	Updated metadata convention publication (new guide/handbook series) Revised sonar-netcdf4 convention publication that includes echosounder data (new guide/handbook series
e	Develop and recommend procedures for collecting and processing quality acoustic data in inclement weather.	Acoustic data are collected from a variety of vessels that respond to inclement weather in diverse ways. Procedures are needed to provide quality control for data collected in inclement weather to stock assessment.	3.3, 3.6	1	CRR; recommendations on methodology improvements to acoustic survey coordination groups to implement on surveys and update SISPs

Summary of the Work Plan

Year 1	Produce the annual overview of recent developments within the field. Produce an ICES CRR recommending procedures for collecting and processing quality acoustic data in inclement weather. Develop and maintain metadata and acoustic data formats.
Year 2	Produce the annual overview of recent developments within the field. Propose a conference session at an international scientific meeting. Develop and maintain metadata and acoustic data formats.
Year 3	Produce the annual overview of recent developments within the field. Collate information on acoustic related research and surveys. Develop and maintain metadata and acoustic data formats. Publish new guides with updated metadata convention and revised sonar-netcdf4 convention publication that includes echosounder data.

Supporting information

Priority	Fisheries acoustics and complementary technologies provide the necessary tools and methods to implement the ecosystem approach to fisheries management within ICES and research into their application and further development is vital.

Justification for venue 2022 (in non-ICES member country)	WGFAST has a long and rich history of collaborating with our West African partners, and hosting a meeting in Senegal will facilitate the participation of scientists from Africa (particularly West Africa and the south Mediterranean area), improve the exchange of science and communication on Fisheries Acoustics, Science and Technology between European and African colleagues, and promote the UN Ocean decade initiative. We expect to recruit several new members to WGFAST and even at higher levels, gain new "observatory" countries for ICES in Africa.
Resource requirements	No new resources will be required. Having overlaps with the other meetings of the Working, Planning, Study and Topic Groups increases efficiency and reduces travel costs.
Participants	The Group is normally attended by some 60-100 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	Stock assessment groups using acoustic abundance indices.
Linkages to other committees o groups	The work in this group is closely aligned with complementary work in the FTFB Working Group. The work is of direct relevance to a number of data collection and coordination groups within EOSG (e.g. WGIPS, WGBITS, WGISUR)
Linkages to other organizations	The work of this group is closely aligned with similar work in FAO, the Acoustical Society of America, the South Pacific Regional Fisheries Management Organization, the Commission for the Conservation of Antarctic Marine Living Resources, and the American Fisheries Society.

Working Group on DATRAS Governance (WGDG)

2019/FT/EOSG06 The **Working Group on DATRAS Governance (WGDG)**, chaired by Ingeborg de Boois, Netherlands, will meet by web conference, four times per year and may also meet physically once per year, to work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2020	26 September 2019 17 December 2019 **18+25 May 2020**	Online meetings Copenhagen, Denmark (during DIG)	E-evaluation	
Year 2021	10 November 2020 28 January 2021 **20 April 2021**	Online meetings	E-evaluation	
Year 2022	22 September 2021 TBD **TBD**	Online meetings Copenhagen, Denmark (during DIG)	Final report by XX May to DSTSG and DIG	

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Further evolve the framework on the governance of DATRAS	DIG had provided a governance framework to review a database in the broadest sense of the word. Transparency about the status of the ICES databases is crucial to maintain and improve the quality of the databases and the data.	3.2, 4.1, 4.2	Generic ToR	A functional and efficient framework with clear responsibilites and taks for the governance of DATRAS.
b	Oversee and advise on the interpretation and prioritisation of recommendations from expert groups addressed to DATRAS	Three different groups (IBTSWG, WGBIFS, WGBEAM) currently provide the survey information directly to DATRAS, and some groups use the DATRAS format as a starting point for datasubmission (e.g. WGIPS). Overview of the general issues and developements is crucial to maintain the system effectively.	3.2, 4.1, 4.2	Generic ToR	A table of prioritised requests from data providers and data users for consideration by the data centre for improvements and updates to the data services on trawl and litter data based on the ICES data infrastructure.
c	Facilitate common functionality in terms of data providers and data user across different surveys to improve upload efficiency and allow broader perspectives (covered by more than one survey) can be effectively addressed.	Alignment over the surveys will facilitate automation processes at the submitter's side, and provide the opportunity to increase the information provided in the sets that have been in DATRAS from the start.	3.2, 4.1, 4.2	Generic ToR	
d	Provide a platform for end user feedback to the DATRAS system, as well as feedback on the outcomes of those suggestions.	A database filled by a significant number of institutes and used by many people and (stock) assessment groups needs to be kept up to date with respect to user requirements without ad-hoc solutions for everyone.	3.2, 4.1, 4.2	Generic ToR	Links to TOR b providing the input for that task in future.

Summary of the Work Plan

Year 1	Work on all terms of reference in four 1.5 hour skype meetings, provide oral report to data and information group (DIG)
Year 2	Work on all terms of reference in four 1.5 hour skype meetings, provide oral report to data and information group (DIG)
Year 3	Work on all terms of reference in four 1.5 hour skype meetings, provide oral report to data and information group (DIG), evaluate the relevance and functioning of the group

Supporting information

Priority	High. WGDG works to align DATRAS for the different surveys, evaluate the database for the Data and Information Group (DIG) and oversee future development of DATRAS. These tasks are well aligned with ICES strategic plan to continue to build our capacity and expertise in managing, analysing, and interpreting data to support science and advice.
Resource requirements	A commitment of time from the members of the group consistent with progressing actions identified in the quarterly meetings
Participants	Members of ICES Data Centre involved in DATRAS developments, chair with a direct link with (=participating in) DIG, representatives of survey groups submitting data to DATRAS (currently WGBIFS, IBTSWG, WGBEAM)
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 very close working relationship with the fish trawl survey groups. There is a strong linkage to DIG as the main umbrella for data/software governance structures.
Linkages to other organizations	No

Working Group on Recreational Fisheries Surveys (WGRFS)

2019/2/EOSG07 The **Working Group on Recreational Fisheries Surveys (WGRFS)**, chaired by Kieran Hyder, UK, and Keno Ferter, Norway, 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	15-19 June 2020	By correspondence	Interim report by 01 November 2020 to EOSG	Keno Ferter's 3 year term as chair ends
Year 2021	14-18 June 2021	TBC	Interim report by 01 November 2021 to DSTSG	Kieran Hyder's 3 year term as chair ends
Year 2022	13-17 June 2022	TBC	Final report by 01 November 2022 to DSTSG	

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Collate and review quality of national estimates of recreational catch and effort, catch-and-release impacts, and socio-economic benefits for candidate stocks, identify significant data gaps in coverage and species, and support the ICES TAF.	Most coutnries are engaged in data collection. This activity collates national participation, catch and socio-economic data sets together, understands the quality of data, and highlights where new data are needed. This is important for supporting the ICES TAF.	5.4	Regular activity in each year, with specfic intersessional tasks to develop new approaches.	Report WG perspectives and publication of scientific papers
b	Assess the validity of traditional knowledge, new survey designs, novel methods (e.g. citizen science, apps), and innovative statistical methods for data provision.	Recreational data can be collected in many ways, with different associated biases. This supports improvement of analysis of existing surveys and understanding the utility of new methods. This will lead to the most robust and broad evidence-base to underpin asessment and advice.	3.1, 3.2, 3.3, 3.6, 4.1, 4.3, 5.4	Regular activity in each year	Report WG perspectives and publication of scientific papers
c	Provide guidance to ICES and respond to ad hoc requests from ACOM on the availability of data, design of data collection programs, data storage systems, use of data in assessments, and catch allocation.	Recreational catche are not included in many assessments and data collection is limited to a few species. This activity suports data collection requirements, access to data and methods needed. This will facilitate embedding recreational fisheries into fisheries management.	3.1, 3.2, 3.3, 3.6, 5,1	Regular activity in each year, with specfic intersessional tasks to develop new approaches.	Report WG perspectives and publication of scientific papers
d	Develop approaches for regional data collection programmes that generate robust data for end users and suport the ICES TAF.	Regionalisation is an important goal, but implementation is unclear This is a challenge for recreational fisheries due to the different actors, gears and survey instruments. This will underpin generation of transparent and robust regional data to support end users needs.	3.1, 3.2, 3.3, 3.6,	Regular activity in each year.	Report WG perspectives and publication of scientific papers

Summary of the Work Plan

Year 1	1)	Establish intersessional groups and leads within WGRFS to progress key tasks including governance, survey design, quality and analysis, regional coordination, data storage, catch-and-release impacts, novel methods, assessment and catch allocation, human dimensions, and communication. (a, b, c, d, e)
	2)	Plan at least three WGRFS publications within the period 2020-22. (a, c, e, f)
	3)	Update the existing quality assessment tool (QAT) and embed this in the TAF (a,d).
	4)	Evaluate the quality of up to three national survey programmes using the QAT. (a)
	5)	Investigate animal welfare issues realted to recreational fisheries (e.g. catch and release) and identify how these could impact management. (a)
	6)	Assess the impact of recreational fisheries on a broad range of stocks using data from the pilot studies. (a, c, d)
	7)	Create a framework for inclusion of recreational data in stock assessments and scope a workshop to design approaches. (a, c, d)
	8)	Collate advances in survey methods that could be used to improved national approaches. (b)
	9)	Develop a solution for storage of data within RDBES and agree with ICES. (c, d, f)
	10)	Review existing governance structures and develop understanding of 'world class' recreational fisheries management that could be embedded in a future revision of the CFP. (e)
	11)	Review outcomes from WKHDR and agree approach for inclusion of angler behaviour in future surveys. (f)
Year 2	1)	Evaluate the outcomes form the intersessional work and agree approach for the next year. (a, b, c, d, e, f)
	2)	Review national programmes including assessment of quality of up to three programmes and provide feedback on tasks requested by ICES. (a)
	3)	Assess the potential of novel survey methods to deliver recreational fisheries data (e.g. citizen science approaches, smartphone apps, traditional knowledge). (b)
	4)	Develop a framework for allocation of catches between sectors based on a review of existing systems and provide best-practice guidance. (c,d)
	5)	Develop MSE approaches to assess the impact of uncertainty in recreational catches on assessment and regional samplin programme. (d).
	6)	Review and share methods for engaging with stakeholders and the potential for particpatory approaches. (e)
	7)	Assess outcomes of workshop on inclusion of recreational data in stock assessments. (f)
Year 3	1)	Evaluate the outcomes form the intersessional work and agree approach for the next year. (a, b, c, d, e)
	2)	Review national programmes including assessment of quality of up to three programmes and provide feedback on tasks requested by ICES. (a)
	3)	Evaluate post-release mortality estimates, potential sublethal effects, and reasonable extrapolations across species and fisheries for inclusion in stock assessments. (a)
	4)	Assess novel approaches for surveys (e.g. combining probabilistic and non-probabilistic sampling) and analysis methods (e.g. treatment of outliers, machine learning). (b)
	5)	Assess the potential for impact of climate change on species caught by recreational fisheries and how that coud impact on DCF and regional species requirements. (c, d)
	6)	Review the potential for food safety and human health issues from consumption of recreational caught fish (e.g. environmental toxins). (e)
	7)	Evaluate progress against three year plan and develop new ToRs. (a, b, c, d, e, f)

Supporting information

Priority	High – the biological, social and economic impact of recreational fishries is becoming increasing recognised and needs to be included in the fisheries assessment and management processes.
Resource requirements	
Participants	The Group is normally attended by around 40 members and chair-invited experts.
Secretariat facilities	Normal backstopping support in the organization of the group.
Financial	None
Linkages to ACOM and groups under ACOM	ACOM, WGBFAS, WGEEL, WGBAST, WGCSE, WGNSSK, WGBIE, WGMEDS, and benmarks workshops for stocks that have recrational catches.
Linkages to other committees or groups	PGDATA, WGCATCH,
Linkages to other organizations	EC, STECF, Regional Coordiantion Groups, Advisory Councils WECAFC/OSPESCA/CRFM/CFMC/MEDAC Working Group on Recreational Fisheries Many linkages to (inter)national angling associations, since WGRFS members estimate national marine recreational catches. Links to broader organizations with interests in angling and fisheries management including EIFACC and FAO.

Working Group on the Acoustic Trawl Data Portal Governance (WGAcousticGOV)

2019/FT/EOSG15 The **Working Group on Acoustic Trawl Data Portal Governance (WGAcousticGov),** chaired by Ciaran O'Donnell (Ireland), will meet by web conference, four times per year and may meet physically once per year, to work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2020	14 September & 10 December	Online meetings	E-evaluation	
Year 2021	1) 25 February - Q1 2) 20 May - Q2 3) 23 September - Q3 4) December - Q4	Online meetings	E-evaluation	
Year 2022	May	Online meetings	Interim report by September to DSTSG	

WGAcousticGov will report on its activities by the March ACOM and SCICOM meetings in the form of a business report the following year to DSTSG and WGFAST.

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Establish a governance framework setting out a forward looking plan, including objectives of the Acoustic Trawl Data Portal, responsibilities, processes and resources.	In order to succesfully develop and maintain a workplan for the Acoustic Trawl Data Portal, it is nessecary to first establish a vision for the future supported by guidelines on project management, handling of feedback, task prioritisation and expected resource availability.	3.2, 4.1, 4.2	3 years/ Generic ToR	The WGAcousticGov manifesto: Mission statement on the direction of the Acoustic Trawl Data Portal development and overarching short to medium terms goals. Guidelines on how to prioritise Definition of resources available Definition of responsibilities.
b	Provide a platform for end user feedback to the the Acoustic Trawl Data Portal.according to the groups guidelines.	The Acoustic Trawl Data Portal should be develop to meet the requirements of end users and thus needs to be responsive to user feedback. To achieve a long-term stability, availability and quality, the Acoustic Trawl Data Portal development requires a workplan with clear objectives and milestones. This can only be sucessfully implemented when resource requirements have been estimated and the availability of resources in known.	3.2, 4.1, 4.2	3 years/Generic ToR	A github site to allow users to submit feedback and requests. Provide an annual workplan, with an agreed and prioritised list of Acoustic related expert group recommendations along with suggested resource allocation, budget estimates and feasability estimates.
c	Coordinate and advise on the interpretation and prioritisation of recommendations, the groups guidlines and requests addressed to the Acoustic Trawl Data Portal.	The project planning cycle needs to be responsive (more than one meeting a year) in order to the Acoustic Trawl Data Portal development effectively. Although there is an annual plan, short term priorities must be evaluated against	3.2, 4.1, 4.2	3 years/ Generic ToR	

		resource availability and needs of the ICES advice processes that vary through the year.			
d	Coordinate the development of user guidance and training for the Acoustic Trawl Data Portal.	As the Acoustic Trawl Data Portal 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.	3.2, 4.1, 4.2	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 conduct via WebEx and followed by subsequent quarterly WebEx meetings in 2020 dealing with ToR c) and d). First physical meeting has not been determined and will most likely not take place in 2020 due to COVID-19 travel restrictions.
Year 2	ToRs c) and d) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with WGFAST for prioritising ToR b), with potential review of ToR a).
Year 3	ToRs c) and d) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with WGFAST for prioritising ToR b), with potential review of ToR a).

Supporting information

Priority	High priority
Resource requirements	No additionaal resource requirement for ICES. A commitment of time from the members of the group consistent with progressing actions identified in the quarterly meetings
Participants	Survey planning groups; WGIPS, WGBIFS, WGACEGG, WGIDEEPS, expert groups WGFAST and WGFTFB and assesment working groups; WGWIDE, HAWG and WGHANSA. One or more members from each WG representing data providers, data users and relavant expert groups. 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	NOAA via participtation by members of WGFAST have expressed interest in joining the group system.

Working Group on Spatial Fisheries Data Governance (WGSFDGOV)

2019/FT/HAPISG08 A **Working Group on Spatial Fisheries Data Governance** (WGSFDGOV), chaired by Christian von Dorrien*, Germany, will be established and will meet 4 times per year via WebEx and may meet physically once per year in association with DIG, to work on ToRs and generate deliverables as listed in the Table below.

	WEBEX Meeting dates	**Meeting dates and Venue**	**Reporting details**	**Comments (change in Chair, etc.)**
Year 2020	1) 4 February - Q1 2) 28 May - Q2 3) 2 September - Q3 4) 10 December - Q4	Online meetings	E-evaluation	
Year 2021	1) 25 February - Q1 2) 23 June - Q2 3) 3 September - Q3 4) TBD - Q4	Online meetings	Interim report to DIG and DSTSG	
Year 2022	1) TBD - Q1 2) TBD - Q2 3) TBD - Q3 4) TBD - Q4	Dates and venue as DIG	Final report by DATE to DIG and SCICOM	

ToR descriptors

ToR	**Description**	**Background**	**Science Plan codes**	**Duration**	**Expected Deliverables**
a	Establish a governance framework setting out a forward looking plan, including objectives of the Acoustic Trawl Data Portal, responsibilities, processes and resources.	In order to succesfully develop and maintain a workplan for the Acoustic Trawl Data Portal, it is nessecary to first establish a vision for the future supported by guidelines on project management, handling of feedback, task prioritisation and expected resource availability.	3.2, 4.1, 4.2	3 years/ Generic ToR	The WGAcousticGov manifesto: Mission statement on the direction of the Acoustic Trawl Data Portal development and overarching short to medium terms goals. Guidelines on how to prioritise Definition of resources available Definition of responsibilities.
b	Based on the guidelines established in ToR A: Provide a platform for user feedback to the VMS and	The VMS DB should develop to meet the requirements of a broad range of users and thus needs to be responsive	4.2, 5.4	3 years/ Generic ToR	A GitHub site allowing users to submit feedback and requests. Provide an annual workplan, with an agreed

	Logbook DB. Feedback will be compiled by WGSpatialFisheriesDataGov and appropriate actions to be taken with assigned responsibilities and resource requirements will be listed and prioritised.	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, the VMS and Logbook DB development requires a workplan with clear objectives and milestones. This can only be sucessfully implemented when resource requirements have been estimated and the availability of resources is known.			and prioritised list of VMS DB related EG recommendations along with suggested resource allocations, budget estimates and feasibility estimates.
c	Using the guidelines established in ToR A and the feedback captured in ToR B: Oversee and advise on the interpretation and prioritisation of recommendations and requests addressed to the VMS and Logbook DB.	The project planning cycle needs to be responsive (more than one meeting a year) in order to manage the the VMS and Logbook DB 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.	3.2, 3.5,	3 years/ Generic ToR	Establish and maintain a 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 data submitter guidance and training for VMS and Logbook DB.	Data submitters require various levels of training including step by step user manuals, tutorials and workshops. Maintenance of documentation of guidelines and procedures will also be necessary.	3.2, 3.5	3 years/ Generic ToR	Annually updated training documentation and workflow. Workshops with specific goals proposed and planned where necessary.

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). First annual meeting intended to coincide with DIG for prioritising ToR b) and review of ToR a)
Year 2	ToRs c) and d) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with DIG for prioritising ToR b), with potential review of ToR a)
Year 3	ToRs c) and d) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with DIG for prioritising ToR b), with potential review of ToR a)

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	DIG and WGSFD representatives, one member each representing data submission, data policy and data use. ICES Secretariat and other related EG members as need be.
Secretariat facilities	Standard (Sharepoint site, remote meeting facilities)
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	This database is an integral component of many groups and products created by ICES EGs, such as Fisheries overviews, WKTRADE, WGBEDPRES, etc..
Linkages to other committees or groups	There is a strong linkage to WGSFD as the group which has coordinated the VMS and logbook data call and quality control of data submissions and products. There is also a strong linkage to DIG as the main umbrella for data/software governance structures.
Linkages to other organizations	OSPAR, HELCOM, RCG, NAFO.

Workshop on Acoustic Backscatter Models (WKABM)

2019/2/EOSG16 The **Workshop on Acoustic Backscatter Models (WKABM)**, chaired by Sven Gastauer*, Germany, will be established and will meet online, 7-8 April 2021, in conjunction with WGFAST to:

a) Review and select commonly used acoustic scattering models and their application/relevance to fisheries acoustics in relation to various objectives; (Science Plan codes: 4.4).

b) Review and select methods to organize digital morphology and anatomical data of aquatic organisms (including data formats, segmentation processes, meshing techniques); (Science Plan codes: 4.4).

c) Review / recommend software platforms and languages in which to develop and disseminate the open source acoustic scattering models (with respect to availability, processing speed, precision, transparency and simplicity); (Science Plan codes: 4.4).

d) Recommend benchmark methodology to compare acoustic scattering models to canonical shapes and field data, including defining boundary conditions and providing clear guidance on the circumstances individual scattering models can be used; (Science Plan codes: 4.4).

e) Develop a set of standardized shapes including a fish body, a fish swimbladder, a backbone, and a zooplankton (e.g., krill) to test and compare acoustic scattering models (including different resolutions and meshing techniques, where needed); (Science Plan codes: 4.4).

f) Discuss the need for future training programmes on the subject of scattering models; Science Plan codes: 4.4).

WKABM will report by 30 June 2022 for the attention of WGFAST, WGIPS, and SCICOM Committees. Additionally, reports and data will be posted to the WKABM's ICES GitHub site.

Supporting information

Priority	This workshop will bring experts together to define and scope a coordinated effort to disseminate acoustic scattering models in open-source fora. Workshop results and recommendations affect processing of acoustic data that are used in stock assessments of pelagic species and the wider pelagic ecosystem. Consequently, these activities are considered to have a very high priority.
Scientifi justification	Terms of Reference a-e) The translation of acoustic energy to biologically meaningful metrics such as numeric density, abundance, and biomass relies on accurate knowledge of acoustic target strength. Acoustic scattering models provide a theoretical foundation for empirical measures of target strength, but these models have been the purview of acousticians and mathematicians. Many of these models are now mature enough so that they can be used by the broader community. One way to bring these models to the community is through open source and open access software. WGFAST proposes to conduct a workshop to initiate this effort and scope strategies for effective development and provision of target strength models to the fisheries acoustics community.
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	Members of WGFAST and guests (15-20 participants expected).
Secretariat facilities	WKABM GitHub repository in the ICES GitHub repository.
Financial	No financial implications.
Linkages to advisory committees	There are no obvious direct linkages with the advisory committee.
Linkages to other committees or groups	There are linkages to SCICOM. There are linkages to all groups currently planning acoustic surveys or using acoustic survey data like WGIPS, WGACEGG, and WGBIFS.
Linkages to other organizations	The work of this group is of international interest to all countries conducting biomass estimation surveys, and to national and international acoustical societies like the Acoustical Society of America and the European Acoustics Association.

The Fourth Workshop on Optimization of Biological Sampling (WKBIOPTIM4)

2019/2/EOSG13 The **Fourth Workshop on Optimization of Biological Sampling (WKBIOPTIM4)** chaired by Gwladys Lambert (UK), Isabella Bitetto (Italy) and Patricia Gonçalves (Portugal) will meet in Bari, Italy, 15–19 November 2021 to:

a) Develop further indicators of length and age frequency data by i) testing the different indicators and quality thresholds using simulations and ii) preparing an R-package with the functions used to calculate them; (Science Plan codes: 3.3);

b) Consolidate and update existing open source code used in previous workshops (BIOPTIM 1-3) and generalize for wider use, , package code and document tools, and assess compatibility of tools with use of standard data formats and sources; (Science Plan codes: 3.2);

c) Continue to provide support on the use of WKBIOPTIM tools with the aim of a future optimization at national/stock/regional levels. (Science Plan codes: 3.2 and 3.3).

WKBIOPTIM 4 will report by 15 December 2021 for the attention of the Ecosystem Observation Steering Group, ACOM and SCICOM.

Supporting information

Priority	This workshop is considered to have a high priority for already established and new commercial fishery and survey sampling programmes developed under the EU-MAP, or for any fisheries data collection schemes with similar scope, such as surveys or recreational fisheries.
Scientifi justification	Statistical sound sampling is very important, if not essential for any sampling scheme. One important component of a "statistically sound design" is that sampling effort is optimized and fit for purpose, i.e. that time and costs spent in sampling can be effectively justified in terms of quality of the information finally provided to end-users The Workshops on Optimization of Biological Sampling (WKBIOPTIM 1, 2, and 3) developed, improved and tested a set of R-scripts (mostly based on the RBD exchange format) producing a range of statistical and graphical outputs to be used for discussion of appropriate levels of biological sampling of different stocks. This workshop aims to consolidate the new knowledge from those workshops into tools and start development on further analyses.
Resource requirements	No additional ICES resources required
Participants	The Workshop is expected to attract wide interest from those involved in WGCATCH and WGBIOP and should include a subset of participants familiar with R-coding to the level of "loop coding" and "function building" and a subset of participants experienced in age and reproduction analysis. In view of its relevance to data collection within ICES, the EU-MAP and regional sampling designs, it should include those involved in the annual planning of sampling and laboratory analysis. Members of survey groups located under EOSG should also be among the participants.
Secretariat facilities	Some secretarial support will be needed.
Financial	Member States may fund this through their EMFF programme
Linkages to advisory committees	ACOM
Linkages to other committees or groups	SCICOM, WGCATCH, WGBIOP, PGDATA, EOSG, Survey WGs (IBTS, IBAS, etc.)
Linkages to other organizations	RCGs. GFCM

Working Group on Commercial Catches (WGCATCH)

2016/2/SSGIEOM23 A **Working Group on Commercial Catches (WGCATCH)**, chaired by Kirsten Birch Håkansson (Denmark), and Estanis Mugerza* (Spain) 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	09-13 November	Online meeting	Interim report by 15 January to EOSG	Estanis Mugerza (Spain) is new co-chair for 2020-2022; Kirsten Birch Håkansson (Denmark) ends 3-yr term as chair; new co-chair will be appointed
Year 2021	To be determined	To be determined	Interim report by 15 January to DSTSG	
Year 2022	To be determinedfined	To be determined	Final report by 31 January to DSTSG	Estanis Mugerza (Spain) ends 3-yr term as co-chair; new co-chair will be appointed

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Review and update guidelines and best-practices for implementation of statistically sound catch sampling and estimation thereof.	Many ICES member states are moving towards more probablistic catch sampling designs. For consistent data use in time series it is necessary to document these changes and to update guidelines and procedures, particulalry in regard to practical sampling issues that make a strict probablistic approach unfeasable as demonstrated by case studies. The update will revise the survey designs classes for catch-sampling programs (WKPICS) in the light of the RDBES and couple it with basic design-based estimation. With ICES moving to a transparent framework for estimating catch parameters, and thereby putting more focus on estimation, good guidelines are needed to support this transition. There is also an increasing need to design commercial sampling	3.1, 3.2, 3.3, 3.5, 3.6	3 years	• Based on real case studies produce a Cooperative Research Report (CRR) with updated guidelines for on-shore and off-shore sampling of commercial cathces (2022). • Develop 3 workshops on estimation o Ratio estimatiors, WKRATIO (2021) o Post-stratification, WKPOST (2021) o Estimation of rare species or events, WKRARE (2022) • Based on WKRATIO produce a Cooperative Research Report (CRR)

		programmes in multi-purpose context, to answer the multiple end-users needs. WGCATCH will continue to propose and endorse WK with the aim of a future optimization at national/stock/regional levels. WKRARE will be planned together with WGBYC. There are increasing examples of the use of other data sources (e.g. grading machines, EM technology) that could be used in estimation. Therefore, there is need to develop guidelines on how QA data and how to combine different data sources. This needs to be developed in coopo-ration with WGTIFD.			with best practice guidelines for choosing and using ration estimators (2022)
b	Review developments in sampling and estimation practices of catch, effort, length and age distributions and other biological parameters of small scale fisheries	WGCATCH continues to review developments for collection of transversal variables (landings, discards and PETS by species, fishing effort) and biological data, length and age distributions, other biological parameters) in small-scale fisheries (SSF) to ensure that the collection of fishing data from SSF across ICES member countries are sufficient, harmonised and comparable and to improve their effectiveness. During its term the WG will focus mainly on five? aspects: 1) evaluate the implementation of guidelines for transversal variables and continue the development of quality indicators and quality checking methodologies ; 2) document sampling effort and develop guidelines for biological data (ength and age distribution, other biological parameters) sampling on SSF; 3) knowledge-sharing on how to improve data collection for SSF (e.g. add a social dimension to understand how to improve data collection, assess the usefullness of sampling approaches, use of new technologies), 4) analysis of the catch fraction of the SSF to	3.1, 3.2, 3.3, 3.5, 3.6	3 years	• Update and refine risk assessment for transversal data quality methodology developed in 2018/2019 (comparison with Large Scale Fleets and scientific estimates) – 2020 • Document sampling effort of biological data on SSF – 2020 • Develop guidelines for SSF biological data sampling. 2021-2022 • Peer-review publication on SSF- 2020 • Continue to develop best practices guidelines on sampling and census data for SSF transversal variables-and evaluate its implementation 2020-2022

		evaluate the impact in the populations of different target species and 5) continue to work on the proper integration of SSF data with their specificities into the RDBES database			
c	Review developments in sampling and estimation of incidental by-catch of Protected, Endangered and Threatened Species (PETS) and other rare species and ensure that database structures support the implementation of the appropriate estimation proceedures.	The sampling and estimation of incidental catches of PETS and other rare species in commercial fisheries has been a long-term ICES concern. WGBYC and WGCATCH are two ICES EGs involved in data compilation and estimation of such rare events and impacts and have been collaborating closely to ensure that by-catch is properly sampled and estimated in national sampling programmes. To improve collaboration between the two groups, WGBYC members participated in the last WGCATCH meeting to reviewed best practices for sampling protocols for incidental by-catches. The roadmap for ICES bycatch advice describes the science needs, and a path for ICES to strengthen its advice on incidental bycatch. WGCATCH has a important role in the roadmap by developing sampling protocols for estimating PET bycatch risk and by improving data availability and quality (e.g. through monitoring). Further work still to be developed particularly in relation to estimation procedures for rare species and ensure the incidental bycatches are included in the RDBES.	3.1, 3.2, 3.3, 3.5, 3.6	3 years	• Continue to support RDBES development to ensure by-c atch data is included in the RDBES (2020-2022). Annual reporting. • Review bycatch estimations of PETS and rare species by other expert groups (2020-2021). Annual reporting. • Report on - and support on board sampling practices at national institutes with regard to PETS (2020-2022). Annual reporting. • Report on - and support redesign of national databases with regard to PETS (2020-2022). Annual reporting.
d	Review and colaborate with SCRDB on design-based sampling and estimation.	The RDBES is the practical tool for ICES to ensure the quality and transparency of commercial catch data. WGCATCH has always supported the development of the RDB and now the RDBES. It's knowledge and expertise on the underlying sampling designs are critical to the appropriate use and implementation of the estimation proceedures required by the ICES advisory process.	3.2, 3.3, 3.6	Routine ToR	Address specific recommendations from the SCRDB and RDBES associated working groups

		The ICES Data Centre and SC-RDB have requested 'WGCATCH to continue advising RDBES development and ensuring the development encompasses statistically sound sampling schemes and proper methods of estimation'.			
e	Collaborate in the advisory process, liaising with assessment groups and benchmarks on commercial catch issues	Commercial catch data is a major input to ICES stock assessments. The accuracy of commercial catch data is highly dependent on the quantity and quality of the sampling and estimation carried by at national level and stock coordinatation level. WGCATCH is the ICES EG that deals with sampling design, estimation and quality of commercial catch data that is provided to the assessment process by the national authorities. It is a key-player in informing on the quality of the time series used and suggesting improvements to sampling and estimation methods. Over 2020-22, WGCATCH will work with the ACOM legacy groups and Fisheries Resources Steeirng Group (FRSG) to have a more active participation in the assessment and benchmark processes.	3.1, 3.2	Routine ToR	• Address specific recommendations from assessment expert groups in relation to commercial catch data to be used/revised in future benchmarks • Activily seek involvement in a review and updated of the current benchmark process for data compilation of commercial catch data, so these take resent WGCATCH findings into account
f	Collaborate with other ICES groups dealing with other aspects of catch data (e.g., WGBIOP, WGRFS, PGDATA, WGTIFD, WGBYC), , RCGs (LM) and commercial catch focused external projects.	WGCATCH links with ACOM, SCICOM, EOSG, EGs under EOSG (e.g., PGDATA, WGBIOP, WGRFS) and the ICES secretariat to inform on guidelines on quality and quantity of catch data. WGCATCH further links and obtains information from research projects that address sampling and estimation of commercial catches	3.1, 3.2	Routine ToR	

Summary of the Work Plan

YEAR 1	ToR a) • Intersessional indentify relevant topics | contents for commercial sampling guidelines and come up with a framework for having ready-available and updated guidelines. Liase with PGDATA, RDBES core group and ICES data centre in the process and take the work done by former WK's into account • Identify practical issues with sampling of commercial catches, focusing on sampling of unsorted catches (sampling of e.g. small pelagic, fish for reduction, fish pumped into factories and processors), start solving the issues and develop tools for identification of issues. Start to develop the guidelines based on these issues, solutions and tools. • Agree on ToRs for the post stratification WK in 2021 (WKPOST). • Review the R-packages developed for optimization of length and age data (in separate WK: WKBIOPTIM4) and discuss results at the meeting. ToR b) • Intersessional produce and complete the templates to document sampling effort of biological data on SSF. Extend the 2018 questionnaire to the large scale fisheries (LSF) and refine the risk assessment for transversal data quality methodology developed in 2018/2019, by including LSF in the risk assesment map and compare SSF and LSF status. Assess the differences between scientific estimate and control data. • Document sampling effort of biological data on SSF • Continue to develop best practices guidelines on sampling and census data for SSF for transversal variables and evaluate its implementation • Following development of RDBES database and making recommendation for the proper integration of SSF data and their specificities into • Peer review publication on SSF • Annual chapter in report detailing work progress, next work-plan and deliverables ToR c) • Continue to support RDBES developments • Report and support on board sampling practices at national institutes, including re-desing of national databases • Initiate review of by-catch estimations of PETS/rare species by other expert groups ToR d) • Intersessional liase with PGDATA and ACOM to start the process of giving WGCATCH (as a proxy for commercial catches) a more active role in the assessment and benchmark processes. ToR e) • This ToR will be dealt with on a yearly basis by WGCATCH. ToR f) • This ToR will be dealt with on a yearly basis by WGCATCH.
YEAR 2	ToR a) • Continue updating and developing the guidelines for commercial sampling. • Identify issues with sampling designs, focusing on sampling of sorted landings on-shore (sampling of e.g. fish for human consumption sold at auctions and other

	landing sites), start solving issues and develop tools for identifying issues. Start to update and develop guidelines based on the issues, solutions and tools. • Intersessional indentify relevant topics | contents for guidelines on estimation of catch parameters and come up with a framework for having ready-avialable and updated guidelines. Liase with the RDBES core group take the work done by former WK's into account, including WGCATCH's estimation WK's in 2021 and former RDBES WK's • Review outcomes of WKRATIO and WKPOST. Start producing best practices for estimation ToR b) • Develop guidelines for SSF biological sampling • Continue to develop best practices guidelines on sampling and census data for SSF transversal variables-and evaluate its implementation • Following development of RDBES database and making recommendation for the proper integration of SSF data and their specificities into • Evaluate the use of geospatial data (e.g. GPS, AIS) to improve effort estimates and produce guidelines • Annual chapter in report detailing work progress, next work-plan and deliverables • Identify stocks for case-studies to analyse the length frequency between SSF and LSF ToR c) • Continue to support RDBES • Report on - and support on board sampling practices at national institutes, including re-desing of national databases • Continue review of by-catch estimations of PETS species by other expert groups • Intersessional liaison with WGBYC and draft ToRs for a WK that addresses estimation of rare things (e.g. species, events) (WKRARE, 2022) in the following year. Taking the review of present methods into account. Approve proposed ToR's at the meeting ToR d) • Intersessional liaise with PGDATA and ACOM to start a process of giving WGCATCH (as a proxy for commercial catches) a more active role in the assessment and benchmark processes ToR e) • This ToR will be dealt with on a yearly basis by WGCATCH. ToR f) • This ToR will be dealt with on a yearly basis by WGCATCH.
YEAR 3	ToR a) • Continuei updating and developing the guidelines for commercial sampling. • Identify issues with sampling designs, focusing on sampling of sorted landings at-sea (e.g. obserserver programes at-sea targeting fish for human consumption), start solving issues and develop tools for identifying issues. Update and develop guidelines based on the issues, solutions and tools. • Continuei updating and developing the guidelines for estimation, taking the work from WKRARE (2022) into account

ToR b)

- Intersessionally produce and issue an informal data call for provision of length frequency data, from the stocks identified in previous meetings
- Analysis on length frequency data from SSF and LSF and evaluate the relevance and impact of SSF data for the stock assessment
- Develop guidelines for SSF biological sampling
- Evaluate the use of geospatial data (e.g. GPS, AIS) to improve effort estimates and produce guidelines
- Continue to develop best practices guidelines on sampling and census data for SSF transversal variables-and evaluate its implementation
- Following development of RDBES database and making recommendation for the proper integration of SSF data and their specificities into
- Annual chapter in report detailing work progress, next work-plan and deliverables

ToR c)

- Continue to support RDBES
- Report on - and support on board sampling practices at national institutes, including re-desing of national databases
- Review outcomes of WKRARE and update guidelines | best pratice (from ToR a) in accordance

ToR d)

- Intersessional liase with PGDATA and ACOM to start the process of giving WGCATCH (as a proxy for commercial catches) a more active role in the assessment and benchmark processes.

ToR e)

- This ToR will be dealt with on a yearly basis by WGCATCH.

ToR f)

- This ToR will be dealt with on a yearly basis by WGCATCH.

Supporting information

Priority	WGCATCH supports the development and quality assurance of regional and national catch sampling schemes and estimation procedures that can provide reliable quality input data to stock assessment and advice, while making the most efficient use of sampling resources. As catch data are the main input data for most stock assessments and mixed fisheries modelling and an essential component of analysis of ecosystem effects of fisheries, especially with regard to the application of the Precautionary Approach, these activities are considered to have a high priority.

Resource requirements	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 in the framework of this group is negligible. WGCATCH builds extensively on experiences gained within PGCCDBS, WKACCU, WKPRECISE, WKMERGE, WKPICS, SGPIDS, WGRFS and previous WGCATCH work in the period 2014-2019. European countries are encouraged to provide the WG with any requested documentation of their sampling programmes and manuals, estimation methods, quality assurance procedures, for review and feedback by the WG, and to ensure that their national members of WGCATCH have sufficient resources to conduct the necessary intersessional work to address the ToRs. The attendance of 1-2 top-level experts in the area of statistically sound sampling and estimation will be secured to review the quality of final outputs of WGCATCH.
Participants	The Group is normally attended by some 30–40 participants, including members, and chair-invited 1-2 external experts.
Secretariat facilities	None.
Financial	Member States may fund this through their EMFF programme. ICES may cover the attendance of reviewers.
Linkages to ACOM and grou under ACOM	WGCATCH falls under the joint ACOM/SCICOM steering group on integrated ecosystem observation and monitoring (EOSG), and supports the ICES advisory process by promoting improvements in quality of fishery data underpinning stock-based and mixed fishery assessments, ecosystem indicators related to fishery affects, and in developing data quality indicators and quality reports for use by assessment EGs and benchmark assessments.
Linkages to other committees or groups	There is a very close working relationship with all catch-related EGs and end-users including WGBIOP (in relation to collection of stock-based biological variables from fishery catches), PGDATA (in relation to data requirements of stock assessment EGs and benchmark assessment groups, optimization of catch sampling programmes and communication of quality information on commercial catch data), WGBYC (in relation to the sampling design and estimation of PETS bycatch and other incidental by-catches), RCM/RCGs and the Liaison Meeting (e.g., in relation to data requirements and regional sampling designs), the SC-RDBES and the ICES Data Centre (in relation to RDBES issues), STECF EWGs dealing with EU-MAP and other legistalitive changes that impact catch sampling and JRC (in relation to data provision from commercial catch sampling programmes).
Linkages to other organizations	The work of this group is closely aligned with similar work in FAO, GFCM, CECAF, NAFO/NEAFC and in the Census of Marine Life Programme.

Workshop on Operational Implementation of Stomach Sampling (WKOISS) *(on hold)*

~~**2019/WK/EOSG11**~~ The **Workshop on operational implementation of stomach sampling** (WKOISS), chaired by Maria Cristina Follesa*, Italy, and [new chair]*, [country], will be established and meet in Cagliari, Italy, [00]–[00] November 2021 to:

This meeting was postponed due to COVID-19. Reference code will change to format: 2020/WK/DSTSG[00]

a) Analyse and discuss the results of the two pilot studies established during the previous WKSTCON (*Merluccius merluccius* for Mediterranean and *Psetta maxima* for Black sea); (Science Plan codes: 1.7);

b) Take into account the pilot studies results and other recent findings from stomach content studies (i.e. Atlantic and Mediterranean areas), select the best-suited methods/indices to fill in data gaps useful by example in the improvement of currently available ecosystemic models; (Science Plan codes: 5.1, 5.2);

c) Taking into account the RCG recommendations, review factors of variability in diet (ontogeny, time, space, etc.), prioritize the most relevant in terms of the effect on stock variability, and propose a sampling plan that takes it into account; (Science Plan codes: 1.7; 3.2; 3.3);
d) Taking into account WKBECOSS and RCG recommendations and WGSAM requirements, propose a standardized sampling scheme and selection method for species (or species groups) and objective of study to be included in stomach content, that could (1) take into account regional similarities and differences in species abundance and importance in community functioning and fisheries and (2) allow comparison between systems; (Science Plan codes: 1.9; 3.1);
e) Develop an appropriate stomach sampling manual (i.e. ATLAS in SmartDots) or guidelines for best practice; (Science Plan codes: 1.5; 1.9);
f) Review formats (e.g. ICES, DAPSTOM as listed in WKBECOSS) for stomach content data and their regional suitability; (Science Plan codes: 3.1);
g) Consider the development of an intercalibration approach that will allow the results obtained separately by several partners at the regional scale to be combined; (Science Plan codes: 3.4; 6.3).

This workshop can be considered as a follow-up to WKSTCON held in Palma de Mallorca, Spain, in April 2018; WKBECOSS held in Santander, Spain, in September 2019; and the June 2020 RCG meetings.

WKOISS will report by [TBD] for the attention of DSTSG, ACOM, SCICOM, and WGBIOP.

Supporting information

Priority	The EU Multi-Annual Programme (EU MAP) on Data Collection requests data on predator-prey relationships and planning for future data collection for each marine region. After the Workshop on Better Coordinated Stomach Sampling (WKBECOSS) in 2019, this meeting on the operational aspects for stomach contents is needed and is urgently to begin to organize the sampling of new biological data from 2020. Therefore, these activities are considered to have a high priority.
Scientific justification	The EU MAP provides a unique opportunity for the regular collection of diet data within fisheries research surveys. To ensure a homogeneous data set with suitable spatio-temporal coverage and make effective and efficient use of available resources, coordination of stomach sampling studies is essential. Stomach sampling is necessary to ensure that multi-species and ecosystem models remain relevant and to support MSFD descriptor 4 regarding the structure and functioning of food webs. This work could benefit the new research on the food web from the ecosystem models.
Resource requirements	None
Participants	Given its relevance to the ICES quality assurance, the workshop is expected to attract interest from the Mediterranean and Atlantic areas, ICES and GFCM. Participants will be experts from leading labs and universities working in stomach contents. The workshop will work closely with the newly formed RCG Intersessional subgroup on Stomach Sampling.
Secretariat facilities	None.
Financial	None.
Linkages to advisory and science committees	ACOM, SCICOM.
Linkages to other groups	WGBIOP, WGSAM, RCGs.
Linkages to other organizations	GFCM.

Group on Governance of the Regional Database & Estimation System (WGRDBESGOV)

2020/FT/DSTSG01 A **Working Group on Governance of the Regional Database & Estimation System** (WGRDBESGOV), chaired by David Currie, Ireland and Katja Ringdahl, Sweden, 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	1st – 3rd December	Online	Interim report by 1st Feb 2021 to DSTSG	
Year 2021	TBC	TBC	Interim report by TBC to DSTSG	
Year 2022	TBC	TBC	Final report by TBC to DSTSG	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Review the status of the development of the new commercial fisheries Regional Database & Estimation System (RDBES) and its project plan for implementation, including the funding of the outstanding development. Adjust the project plan as required. Oversee and advise on the interpretation and prioritisation of recommendations for the RDBES development. Identify user guidance and training required for RDBES users.	The commercial fisheries Regional Database & Estimation System (RDBES) will be extensively used by ICES member states, the EU Regional Coordination Groups, and ICES expert groups to store detailed commercial fisheries sample data. The RDBES is also intended to replace the current ICES InterCatch system so will also function as a database and estimation system for ICES Fisheries Advice. The RDBES is therefore a key development to support the ICES advisory process.	3.1, 3.2, 3.3	3 years	An up-to-date roadmap for the Regional Database & Estimation System (RDBES) developments describing when functionality will be available. The RDBES project plan is monitored and fulfilled. Recommendations for relevant workshops are made.
b	Provide a platform for user feedback to the Regional Database & Estimation System (RDBES). Appropriate actions to be taken with assigned responsibilities and resource requirements will be listed and prioritised. Ensure that any required sub-groups (including the existing "Core group") are created and function effectively whilst needed.	The Regional Database & Estimation System (RDBES) should develop to meet the requirements of a broad range of users and thus needs to be responsive to user feedback.	3.1, 3.2, 3.3	3 years / generic ToR	A public Regional Database & Estimation System (RDBES) GitHub site is maintained - this makes the data model available, and provides a platform for users to raise and discuss issues. Sub-groups (such as the existing "Core group") complete any required tasks (e.g.

					refining specifications and answering user queries) Recommendations from users are responded to.
c	Oversee and summarize how the existing commercial fisheries Regional Database (RDB) and the new Regional Database & Estimation System (RDBES) are used in the EU Regional Coordination Groups (RCGs), and ICES expert groups, along with any other uses. Where possible, share any outputs with other interested groups and users.	The aims of the new Regional Database & Estimation System (RDBES) include increasing the awareness of fisheries data collected by the users of the RDBES and the overall usage of these data. Therefor it is important to monitor how different users are using the data.	3.1, 3.2, 3.3	3 years / generic ToR	Summaries of the existing commercial fisheries Regional Database (RDB) and the new Regional Database & Estimation System (RDBES) data calls are published annually. Summaries of the use of RDB/RDBES data are published annually.
d	Review the data governance framework of the commercial fisheries Regional Database (RDB) and Regional Database & Estimation System (RDBES)	The Regional Database & Estimation System (RDBES) is intended to host data from multiple ICES member countries and EU member states. Different users will have different permissions (depending on their needs). Data governance of the RDBES is therefore a key topic to ensure that it can function in a secure and efficient manner.	3.1, 3.2, 3.3	3 years / generic ToR	Appropriate Regional Database (RDB) and Regional Database & Estimation System (RDBES) data governance policies are agreed and implemented

Summary of the Work Plan

	An annual meeting will be held, as well as any inter-sessional work required, to work on the ToRs. ToR a) • Review the Regional Database & Estimation System (RDBES) project plan. • Review feedback summaries from RDBES workshops (such as WKRDB-POP2, WKRDB-EST2, WKRDB-RAISETAF) • Review results and feedback from the RDBES test data call. • Adjust the project plan as required. ToR b) • Information on the public RDBES GitHub (https://github.com/ices-tools-dev/RDBES) site is kept up-to-date • Issues raised on the GitHub site are responded to in a timely manner • The "Core group" (and any other required sub-groups) meet as required to work effectively.
Year 1 - 3	ToR c)

	• Review and summarise responses to the RDB/RDBES data calls • Determine which groups have used RDB/RDBES data during the year and, where possible, view any of their outputs based on RDB/RDBES data. • Review any feedback arising from those groups. • Ensure all data governance policies are being adhered to during data use. • Where possible, share outputs and code from the different users of RDB/RDBES data
ToR d)	• Review the RDB/RDBES data policy and draft amendments if required • Review the "Conditions for detailed RDBES data use" document • Make any further changes required to the RDB/RDBES data governance policies and procedures • Ensure data governance will be suitable for using RDBES data within ICES stock assessment

Supporting information

Priority	The activities of this group will ensure the development of the commercial fisheries Regional Database and Estimation System, RDBES, whilst still maintaining the existing Regional Database (RDB) during the development period. The RDBES when it is implemented works as a database for the Baltic Sea, North Sea & Eastern Arctic, North Atlantic and Long Distance Fisheries Regional Coordination Groups (RCGs). The RDBES is also intended to replace the current ICES InterCatch system so it will also function as a database and estimation system for ICES Fisheries Advice. Consequently, these activities are considered to have a high priority.
Resource requirements	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 in the framework of this group are negligible. Countries are encouraged to ensure that their national members have sufficient resources to conduct the necessary intersessional work to address the ToRs. For EU Member States, work within this WG can be funded under the Data Collection Framework (DCF)/European Maritime, Fisheries and Aquaculture Fund (EMFAF).
Participants	The Group is normally attended by some 20–25 members and guests.
Secretariat facilities	SharePoint and meeting room requirement.
Financial	No financial implications.
Linkages to ACOM and grou under ACOM	There are no direct linkages with ACOM, but most of the stock assessment Working Groups will be impacted by the development of the RDBES.
Linkages to other committees or groups	There is a strong thematic link with groups including WGCATCH and WGBIOP. Since the RDBES will interact with the ICES Transparent Assessment Framework (TAF) there is also a close link with WGTAFGOV. It will also be relevant to other data governance groups under the new Data Science and Technology Steering Group (DSTSG).
Linkages to other organizations	The RDBES will support the work of the EU Regional Coordination Groups (RCGs).

Workshop on Age estimation of European anchovy (Engraulis encrasicolus) (WKARA3) *(on hold)*

2020/WK/DSTSG02 A **Workshop on Age estimation of European anchovy (*Engraulis encrasicolus*) (WKARA3)**, chaired by Gualtiero Basilone*, Italy, will be established and will meet in Capo Granitola, Sicily, Italy, in November 2021 to:

a) Review information on anchovy age determination, otolith exchanges, workshops, and validation work done so far; (Science Plan codes: 5.1, 5.2);
b) Analyse growth increment patterns in anchovy otoliths and improve (if necessary) the guidelines for their interpretation; (Science Plan codes: 5.1, 5.2);
c) Analyse the results of the exchanges carried out in 2018 and the potential source of discrepancies, according to the literature review and new validation studies carried out; (Science Plan codes: 5.1, 5.2);
d) Increase existing reference collections of agreed aged otoliths by stocks and areas; (Science Plan codes: 5.1, 5.2);
e) Address the generic ToRs adopted for workshops on age calibration (see: WGBIOP Guidelines for Workshops on Age Calibration); (Science Plan codes: 5.1, 5.2).

This workshop can be considered as a follow-up to WKSTCON held in Palma de Mallorca, Spain, in April 2018; WKBECOSS held in Santander, Spain, in September 2019; and the June 2020 RCG meetings.

WKARA3 will report by [TBD] for the attention of DSTSG, ACOM, SCICOM, and WGBIOP.

Supporting information

Priority	Age determination is an essential feature in fish stock assessment to estimate the rates of mortality and growth. In order to arrive at appropriate management advice, ageing procedures must be reliable. Age data are provided by different laboratories and countries using internationally agreed ageing criteria. It is necessary to continue to clarify the guideline of age interpretation. Therefore, otolith exchanges should be carried out on a regular basis, and if serious problems exist age reading workshops should be organised to solve these problems.
Scientific justification	An otolith exchange was made in 2018 and at WKARA2 results from this otolith exchange will be presented and discussed, given the poor precision of age determination resulting from the exchange programme. Presentation of new validation or corroboration studies. Involvement of others research groups also from different Mediterranean Sea areas (i.e. EU and non-EU countries with shared resources).
Resource requirements	No specific resource requirements beyond the need for members to prepare for and participate in the meeting.
Participants	Given its relevance to the ICES quality assurance, the workshop is expected to attract wide interest from both Mediterranean and Atlantic areas, ICES and the General Fisheries Commission for the Mediterranean (GFCM). The workshop tries to bring together international experts on anchovy age reading and fish growth and scientists involved in stock assessment to assess the accuracy and precision of the age determination.
Secretariat facilities	None.
Financial	None.
Linkages to advisory and science committees	ACOM, SCICOM.
Linkages to other groups	WGBIOP, WGCOMEDA and WGHANSA.
Linkages to other organizations	GFCM Working Group on Stock Assessment of Small Pelagic Species (WGSASP).

Working Group on the Governance of Quality Management of Data and Advice (WGQuality)

2020/FT/DSTSG03 A **Working Group on the Governance of Quality Management of Data and Advice** (WGQuality), chaired by David Currie*, Ireland, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2021	19-22 January	Web conference	Interim report by 1st March 2021 to DSTSG	
Year 2022	TBC	TBC	Interim report by Date Month May to DSTSG	
Year 2023	TBC	TBC	Final report by Date Month May to DSTSG	

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Analyse existing ICES quality management processes within advice production and evaluate their coherence with the objectives of the ICES advisory plan. In particular highlight any gaps and overlaps between different processes.	The concept of "quality" is cross-cutting and should be managed throughout a process. The ICES advisory plan highlights the first priority area for development is "Assuring Quality" - it states that quality assurance "encompasses the entire process from data collection to the publication of objective and independent advice". .	3.1, 3.2, 3.3	3 years	An evaluation of the existing quality processes and procedures within ICES.
b	Specify a fully operational ICES advisory quality management system that is in line with the scope and direction in the advice plan.	There is a recognition within ICES of the need for an end-to-end quality management system (QMS) to encompass best practice in data management, data integration, and translation into advice. A QMS is defined as "…a formalized system that documents processes, procedures, and responsibilities for achieving quality policies and objectives".	3.1, 3.2, 3.3	3 years	A draft ICES quality manual which will describe the overall approach to assuring the quality of assessment and advice within ICES. This will cover the quality assurance process from data collection to advice publication.
c	Create and implement an internal communication	There is a large amount of activity in the ICES world focussing on data needs for assessment	3.1, 3.2, 3.3	3 years	Quality assurance communication plan for the ICES network.

	plan to explain the quality management system, ensure effective feedback mechanisms to identify needed improvements and highlight existing good practice.	and advice. One of the major benefits of having a large number of expert groups, organisations, and individuals participating in this process is the high level of innovation displayed. However, the downsides of this can include a lack of knowledge about what other work is being done by other people and a lack of coordination in harnessing this work.			
d	Use the quality management system to evaluate current activities.	Identify gaps and create a plan to fill them. Prioritise issues, identify unnecessary duplication of activities, and propose remedies.	3.1, 3.2, 3.3	3 years	
e	Operationalise the quality tools and processes that were proposed during the previous 3-year cycle of PGDATA.	PGDATA has previously proposed a number of interesting tools and processes to improve the data informing the assessment and advice process. With the new RDBES/TAF system becoming fully operational over this next work cycle, this is an ideal time to embed these within the workflow. To this end, the next 3-year cycle should also ensure that these ideas are operationalised.	3.1, 3.2, 3.3	3 years	The finalised "Series of ICES Sampling Protocols" template proposed by PGDATA for fisheries dependent data. Documents (based on the temple) describing commercial sampling programs have been created by countries. The process to link the completed documents to data submitted to the commercial fisheries Regional Database & Estimation System (RDBES) is agreed. The procedure to make these documents available to stock assessment groups via the RDBES and Transparent Assessment Framework (TAF) has been agreed and tested. Structure and maintenance of PGCCDBS repository is agreed RDBES/TAF script and tools repository

Summary of the Work Plan

YEAR 1	ToR a) and b) • Collate existing policies that relate to the quality of ICES advice and identify any gaps. • Agree on a format for the ICES quality manual and which ICES publication type it fits best • Create a first draft an ICES quality manual for the advisory process – the purpose of the manual is to document the overall approach to quality management of advice within ICES. The working group will not be looking to invent multiple new procedures but will instead concentrate on compiling and collating the existing procedures into a coherent whole. • Identify the types of generic processes within ICES that contribute to advice outputs. ToR c) • Outline a communication plan for the 3-year cycle of the working group.

	• Identify key stakeholders that should be prioritised • Identify the key messages that should be communicated ToR d) • Limited activity expected in year 1 ToR e) • Identify if are all data collected and used for advice purposes are covered by an identified sampling protocol (e.g. the Series of ICES Sampling protocols used for surveys, and the PGDATA proposed "Series of ICES Sampling Protocols" for fisheries dependent data) • Finalise the "Series of ICES Sampling Protocols" template for fisheries dependent data and encourage countries to start using it. • Investigate the feasibility of a "species identification" app and other ideas produced by PGDATA • Review status of the PGCCDBS (Data Quality Assurance) repository and agree on the way forward. • Review draft ICES advice and RDBES data calls and give feedback
YEAR 2	ToR a) and b) • Revise draft ICES quality manual in line with feedback • Define what documentation is needed for the processes that contribute to ICES advice (such as process flows, standard operating procedures, guidelines, and manuals). Propose tools such as standard templates when required • Propose who will need to complete the documentation e.g. a benchmark assessment group. ToR c) • Review and refine communication plan • Identify key targets for year 2 and year 3, alongside the stakeholders identified for Year 1 ToR d) • Use the quality management system described in the quality manual to identify gaps in processes • Begin identifying new or revised tools or processes that can fill the identified gaps. Tools could refer to code but might also could be "soft" items such as decision support flow-charts. The group would not intend to create all the identified tools ourselves. ToR e) • Start to create a collection of useful data quality, scripts, graphs and function that can be used within the RDBES/TAF. Design processes that will allow people to contribute to this work. Agree how this work fits with the PGCCDBS (Data Quality Assurance) repository and how it will be maintained. • Review draft ICES advice and RDBES data calls and give feedback
YEAR 3	ToR a) and b) • Revise draft ICES quality manual in line with feedback • Track and review the documentation. ToR c) • Refine year 3 of the communication plan and implement it ToR d) • Use the quality management system described in the quality manual to identify gaps in processes • Continue identifying new or revised tools or processes that can fill the identified gaps ToR e) • Promote the data quality and RDBES/TAF repository/ies. • Review draft ICES advice and RDBES data calls and give feedback

Supporting information

Priority	Improving quality assurance processes is a key priority for ICES and is a priority area of the ICES Advice Plan – the work of this group is thus considered as a high priority.
Resource requirements	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 in the framework of this group is negligible. WGQuality builds extensively on experiences gained within PGDATA and PGCCDBS. Countries are encouraged to ensure that their national members have sufficient resources to conduct the necessary intersessional work to address the ToRs. For EU Member States, work within this WG can be funded under the Data Collection Framework (DCF)/European Maritime, Fisheries and Aquaculture Fund (EMFAF).
Participants	The Group is normally attended by some 20–25 members and guests. The participants at WGQuality should represent the entire process from data collection (fisheries dependent and independent data) to the publication of objective and independent advice.
Secretariat facilities	SharePoint and meeting room requirement.
Financial	No financial implications.
Linkages to ACOM and grou under ACOM	There will be strong linkage with ACOM
Linkages to other committees or groups	The work within this group is very relevant to the groups within the FRSG and forthcoming DSTSG (particularly WGCATCH, WGBIOP and WGRDBESGOV). This work will also be relevant to groups within the IEASG, in particular since a wide variety of data sources will be contributing to the outputs of those groups.
Linkages to other organizations	There is a natural link to similar issues of quality assurance in the EU Regional Coordination Groups.

Workshop on Estimation of Commercial Catches I – Ratio estimators (WKRATIO)

2020/WK/DSTSG04 The **Workshop on Estimation of Commercial Catches I – Ratio estimators (WKRATIO)** chaired by Liz Clarke* (UK-Scotland) and Laurent Dubroca* (France), will meet in online, 31 May – 4 June 2021 to:

a) Develop and test R-scripts for statistically-based ratio estimators for length and age for landings and discards that follow the sampling design, using RDBES exchange format. (Science Plan Codes: 3.3)

WKRATIO will report by 18 June 2021 for the attention of the Data Science and Technology Steering Group, ACOM and SCICOM.

Supporting Information

Priority	This workshop is considered to have a high priority to support the development of the RDBES, by developing improved ratio estimation methods that increase the transparency and the quality of the estimates used in the stock assessment groups, and that will be used as estimation routines in the RDBES.

Scientific justification	Currently, most countries use ratio estimators for their national estimation of commercial catch data. Recent discussions at WGCATCH and other EGs have increasingly highlighted that estimation techniques currently used by many countries to process commercial catch data may not be the most up-to-date and/or ignore sampling design and/or are far from transparent and standardized and involve significant levels of ad-hoc decisions. One of the focus for the next 3 year work plan of WGCATCH is to produce best practice guidelines for choosing methods and variables used to analyse commercial sampling data (algorithms, tools for analysing the appropriateness of using the specific estimator: Ratio estimators and estimation of variance). The outcomes of this workshop are important for WGCATCH to evaluate prior to their incorporation as regular estimation routines in RBDES.
Resource requirements	Participants are requested to document sampling designs and estimation methods ahead of the meeting; and to bring to the meeting commercial catch data: landings and sampling catch data stored in the latest RDBES exchange format. IT resources required for international virtual meeting,
Participants	The target attendance are participants from ICES member countries involved in providing commercial catch data to the stock assessment groups and use ratio estimators for their discard and biological estimates. Participants should have prior experience in statistically sound sampling and/or estimation and/or r-scripting. 10–20 participants are expected to attend.
Secretariat facilities	ICES will provide SharePoint access and ICES Secretariat support.
Financial	EU Member States may fund this through their EMFF programme
Linkages to advisory committees	ACOM, SCICOM, DSTSG
Linkages to other committees or groups	WGCATCH, WGQUALITY, WGRDBESGOV and associated RDBES group.
Linkages to other organizations	Regional Coordination Groups, General Fisheries Commission for the Mediterranean

Third Workshop on Populating the RDBES data model (WKRDB-POP3)

2020/WK/DSTSG05 The **Third Workshop on Populating the RDBES data model (WKRDB-POP3)** chaired by David Currie, Ireland and Edvin Fuglebakk, Norway will be held online from 14th - 18th June 2021 to:

a. Describe and explain the RDBES data model to national data submitters using worked examples (Science Plan Codes: 3.1, 3.2, 3.3).
b. Provide hands-on guidance and assistance to national data submitters to write working data extraction scripts to convert national data formats to the RDBES data format (Science Plan Codes: 3.1, 3.2, 3.3).
c. Identify and document any problems in converting national data formats to the RDBES format (Science Plan Codes: 3.1, 3.2, 3.3).
d. Facilitate wider participation in testing of the RDBES data submission system (Science Plan Codes: 3.1, 3.2, 3.3).

WKRDB-POP3 will report by 31 August 2021 for the attention of the Data Science and Technology Steering Group, ACOM and SCICOM.

Supporting information

Priority	The activities of this workshop will promote the development of a Regional Database and Estimation System, RDBES. This workshop will help countries to correctly convert their national data formats to the RDBES format. The RDBES when it is implemented works as a database for the Baltic Sea, North Sea & Eastern Arctic, North Atlantic and Long Distance Fisheries Regional Coordination Groups (RCGs). The RDBES will also function as a database and estimation system for ICES Fisheries Advice. The development will concentrate on harmonisation, quality assuring, documentation, approved estimation methods and transparency. Consequently, these activities are considered to have a very high priority. ICES will issue a data call in 2021 for 2020 samples for selected stocks, and 2020 landings and effort data for all stocks, in the new RDBES format. The ideal conclusion is that at the end of this workshop each person attending has developed working scripts to extract the data that will be requested by the RDBES data call
Scientific justification	The RDBES will be extensively used by the RCGs and ICES both to store detailed fisheries sample data and use it for estimation - therefore it is essential that national data submitters are familiar with the RDBES format and confident in correctly converting their national data to this format. The WKRDB-POP in 2019 and WKRDB-POP2 in 2020 started this process but it is necessary to hold a third workshop because (i) there have been minor changes to the RDBES data model since the last workshop, and (ii) not all institutes submitting data was able to submit data to the 2020 test data call, and support for further work on data conversion routines are indicated. **ToR a) – Describe and explain the RDBES data model to national data submitters using worked examples** The RDBES data format will be explained using its documentation, and a number of worked examples. These worked examples will play an important role in illustrating the types of decisions that data submitters will need to make.

	ToR b) – Provide hands-on guidance and assistance to national data submitters to write working data extraction scripts to convert national data formats to the RDBES data format This is the most important part of the workshop and will occupy the majority of the workshop's time - it will entail the RDBES Core Group providing practical online assistance to the attendees. The workshop attendees must be familiar with their own national sampling programme designs, and must have made preparations necessary to provide real data sets of their national samples to the workshop. The Core Group will then help them to convert their data to the new RDBES format. The more work that attendees have done in trying to populate the RDBES format with their own data before the workshop the more value they will gain from this work. When new questions are identified and resolved they can be added to the RDBES "Frequently Asked Questions" so that other people can benefit from the answers. **ToR c) – Identify and document any problems in converting national data formats to the RDBES format problems** If it is not clear how particular data should be converted to the RDBES format then this will be recorded for future discussion and resolution. **ToR d) - Encourage national data submitters to join the RDBES testing group** WKRDB-POP 2 participants contributed significantly to testing the RDBES data submission system in the interim between that workshop and the deadline for the test-data call. This was key in addressing many specific software issues, and it would be desirable to exand this testing group to a wider selection of national data-submitters. Rigorous and in-depth testing is vital to ensure RDBES can meet its deliverables and to ensure the system and all supporting facilities are functioning as envisioned and designed.
Resource requirements	Members of the "RDBES Core Group" will be requested to participate as hands-on instructors/demonstrators. The ICES Data Centre will provide technical support for RDBES data uploading.
Participants	~60 people
Secretariat facilities	SharePoint, Online meeting room support
Financial	No financial implications.
Linkages to advisory committees	There are no direct linkages with the advisory committees, but most of the stock assessment Working Groups will be impacted by the development of the RDBES.
Linkages to other committees or groups	There is a link to WGCATCH, WGQUALITY and WGBYC.
Linkages to other organizations	The RDBES will support the work done by the RCGs under the European Commission, EC. The aim is also allow the RDBES to support the countries in providing data for the data calls under the EC.

Workshop on use of Ageing and Maturity Staging Error Matrices in Stock Assessment (WKAMEMSA)

2020/WK/DSTSG06 The **Workshop on use of Ageing and Maturity Staging Error Matrices in Stock Assessment (WKAMEMSA)**, chaired by Alfonso Pérez-Rodríguez (IMR-Norway) and Karen Bekaert (ILVO-Belgium), will be established and will meet online, 27-29 September 2021, to:

a) Revision of existing research on the effects of ageing and maturity staging error in stock assessment, including examples where incorporation of age/maturity error has been tested on the stock assessment output (Science Plan codes: 5.1 & 5.2).

b) Review the existing SmartDots data output, the analysis applied and the report templates. Consider the current protocols for otolith and gonad selection outlined in the WGBIOP Guidelines for Exchanges and Workshops on Age Reading and Maturity Staging. Outline future work depending on the outcomes of this workshop (Science Plan codes: 4.1 & 4.3).

c) Examine the potential to incorporate age and maturity error information into the main assessment models currently used within ICES. Identify the data input and modifications in the model structures that would be required, as well as the steps needed to incorporate those changes into the assessment platforms (e.g. stockassessment.org) (Science Plan codes: 5.1 & 5.2).

d) Identify potential stock level case studies where evidence of important error exists in the determination of age, maturity or both, and where evaluation models with the potential capacity to incorporate this information can be developed (Science Plan codes: 4.1, 4.3, 5.1 & 5.2).

e) Consider the future integration with TAF and feedback to TAFGOV on the workshop outcome (Science Plan codes: 6.1).

WKAMEMSA will report by 10 November 2021 for the attention of ACOM/SCICOM.

Supporting information

Priority	The current activities of this Group will lead ICES into issues related to the use of ageing and maturity staging error information in stock assessment and the effect of this error in stock assessment uncertainty. Consequently, these activities are considered to have a very high priority.
Scientific justification	Term of reference a) The problem of error in age determination and maturity staging, and their impact in stock assessment has been treated before in previous studies and the subject would benefit from a review of progress and an evaluation of the results obtained. Having this review would likely help to identify the directions that should be followed. Term of reference b) As part of the process to develop an approach to consider ageing and maturity staging error into stock assessment it is necessary to review the protocol for otolith and gonads selection in the exchange events available in Smartdots, as well as the statistical analysis conducted and the way the error matrices are calculated. This is a necessary step to ensure that the quality of the statistical information, and the structure of the report output is suitable and contains useful information for the relevant stock assessment models. Term of reference c) This ToR is intended to identify the models that have potential capacity to incorporate age and maturity error information. The work that will be needed to do it, and the steps required to integrate those model modifications in the assessment platforms will be

	defined. The output of this ToR, in combination with ToR b, will identify the necessary modifications needed in the WGBIOP protocol and the SmartDots data analysis to support the assessment model requirements. Term of reference d) After the protocols to collect and analyze the data, and the models that can incorporate this information have been identified, it is necessary to to review the ICES stocks that could be considered as candidate case studies to continue developing the incorporation of age error information in stock assessment. Term of reference e) This ToRs is intended to integrate with the ICES transparency and quality frameworks. Although it is not expected that in the early steps this will be a crucial element, considering it from the early steps might be useful to accommodate adequately all modifications in the assessment models.
Resource requirements	The research programmes which provide the main input to this group are already underway. The additional resources required to undertake additional activities in the framework of this group is negligible. There are no additional resource requirements for the workshop beyond the secretariat support for group organisation.
Participants	The Group will be attended by approximately 12 participants.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory committees	There are no obvious direct linkages with the advisory committees.
Linkages to other committees or groups	There is a very close working relationship with WGBIOP, WGSMART and it is expected to be relevant for the WGs in charge of the assessment of the case study stocks. Depending on the progress, the interest of the output might be extensive to all the WGs that use the assessment models that end up incorporating the age error information.
Linkages to other organizations	No linkages to other organizations

Working Group on Estimation with the RDBES data model (WGRDBES-EST)

2020/FT/DSTSG07 A **Working Group on Estimation with the RDBES data model (WGRDBES-EST)**, chaired by Kirsten Birch Håkansson, Denmark, and Nuno Prista, Sweden, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2021	20-24 September	Online	Interim report by 18 December to DSTSG	Kirsten Birch Håkannson, Denmark Nuno Prista, Sweden
Year 2022	To be determined	To be determined	Interim report by tbd to DSTSG	Kirsten Birch Håkannson, Denmark Nuno Prista, Sweden

Year 2023	To be determined	To be determined	Final report by tbd to DSTSG	Kirsten Birch Håkannson, Denmark Nuno Prista, Sweden

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Develop and document R scripts and functions for statistical estimation using the RDBES data format	The Regional Database & Estimation System (RDBES) will be extensively used by ICES member states, the EU Regional Coordination Groups, and ICES expert groups to store detailed commercial fisheries sample data. The RDBES will also replace the current ICES InterCatch system and function both as a database and an estimation system for ICES Fisheries Advice. Estimation within the RDBES will be done by means of R-scripts and functions that secure the transparency and reproducibility of assessment inputs. The estimation code will ultimately integrate TAF and make national and regional estimates more transparent. WKRDB-EST (1&2) have started developing those scripts and functions in what regards the simpler forms of design-based estimation. WGRDBES-EST will continue and finalize that work, extending it to more complex statistical estimation methods.	3.1, 3.2, 3.3	Regular activity every year with intersessional work	Documented R-scripts and functions to be added to icesRDBES package
b	Identify and document any problems with RDBES data model relating to statistical estimation	In coming years the RDBES data model will keep being improved and updated as feedback is received from RCGs, EGs (e.g., WGCATCH, WGBYC) and national users. The implications of those improvements and	3.1, 3.2, 3.3	Regular activity every year	List of recommendations to ICES data center, Core Group of RDBES development and WGRDBESGOV on aspects needing development in the RDBES data model

		updates for estimation within the RDBES will need continuous evaluation. In addition new aspects will likely be found requiring incorporation in the data model so that specific estimation methods can be implemented or specific results produced. WGRDBES-EST will contribute to the identification and evaluation of these new features and data-model related aspects.			
c	Coordinate the peer-review and inclusion of ToR a) outputs in the icesRDBES package	Worldwide availability and systematic code and methodological peer review of RDBES estimation functions and scripts may be achieved by incorporation of main estimation functions in the icesRDBES package and publication on CRAN (https://cran.r-project.org/).	3.1, 3.2, 3.3	Regular activity every year with intersessional work	IcesRDBES package and associated peer-reviewed documentation
d	Establish a road forward to the improvement of estimates of commercial catches used in ICES assessments	As the work of WGRDBES-EST progresses there is a need to update and inform WGRDBESGOV on the best path forward to keep improving commercial catch estimates used in ICES.	3.1, 3.2, 3.3	Regular activity every year	List of recommendations to WGRDBESGOV on aspects needing consideration in efforts to improve estimation of commercial catches
e	Collaborate with WGRDBESGOV and WGTAFGOV to secure the integration of outputs from WGRDBES-EST in TAF	Transparency on the use of outputs from WGRDBES-EST can be achieved by integrating the estimation scripts and/or its outputs in TAF.	3.1, 3.2, 3.3	Regular activity every year	Outputs from WGRDBES-EST are fit and ready for integration within TAF

Summary of the Work Plan

Year 1	ToR a) Discuss the feedback from WGRDBESGOV and RDBES core group on WKRDB-EST2 progress alongside results achieved intersessionally, and identify the R-code that needs development, refinement and/or testing. Develop that code and functions. ToR b) Evaluate updates of the RDBES data model from an estimation perspective. Document any problems with RDBES data model relating to statistical estimation and suggest solutions. ToR c) Continue the work started during WKRDB-EST2 in icesRDBES package, incorporating existing developments; prepare a standalone icesPackage; test and implement compatibility of the

	icesRDBES package with CRAN requirements; suggest a work-flow and roadmap for peer-review of icesRDBES functions and scripts. ToR d) evaluate progress obtained in estimation of commercial catches and suggest a way forward to WGRDBESGOV. ToR e) Initiate the collaboration with WGRDBESGOV (and relevant groups thereunder) and WGTAFGOV to identify requirements for an integration of WGRDBES-EST outputs into TAF
Year 2	ToR a) Discuss the feedback from WGRDBESGOV and RDBES core group on last years progress alongside developments achieved in interssessional work, related WKs and WGs and individual contributions related to commercial catch estimation. Identify the R-code that needs development, refinement and/or testing. Develop that code and functions. ToR b) Evaluate intersessional updates of the RDBES data model from an estimation perspective.. Document any problems with RDBES data model relating to statistical estimation and suggest solutions. ToR c) Continue the work on the icesRDBES package; test and implement compatibility of the icesRDBES package with CRAN requirements; test work-flow and advise on roadmap for longer term icesRDBES maintainence to WGRDBESGOV. ToR d) evaluate progress obtained in estimation of commercial catches and suggest a way forward to WGRDBESGOV. ToR e) In collaboration with WGRDBESGOV (and relevant groups thereunder) and WGTAFGOV conclude on requirements for a integration of WGRDBES-EST outputs into TAF and adapt output to the requirements
Year 3	ToR a) Discuss the feedback from WGRDBESGOV and RDBES core group on last years' progress alongside developments achieved in interssessional work, related WKs and WGs and individual contributions related to commercial catch estimation. Identify the R-code that needs development, refinement and/or testing. Develop that code and functions. ToR b) Evaluate intersessional updates of the RDBES data model from an estimation perspective. Document any problems with RDBES data model relating to statistical estimation and suggest solutions. ToR c) Continue the work of previous year in icesRDBES package, incorporating new developments; Publish the icesRDBES package on CRAN. ToR d) evaluate progress obtained in estimation of commercial catches and suggest a way forward to WGRDBESGOV. ToR e) Continue the work of previous year and in collaboration with WGRDBESGOV (and relevant groups thereunder) and WGTAFGOV keep updated on potential changes in the requirements for integration.

Supporting information

Priority	This working group is considered of very high priority. The activities of this WG will promote the development of a Regional Database and Estimation System (RDBES) by developing the algorithms and code required for the estimation of commercial catches within the RDBES. The RDBES will be integrated in TAF and work as a database for both ICES and the Baltic Sea, North Sea & Eastern Arctic, and North Atlantic Regional Coordination Groups (RCGs), producing the high-quality, transparent, estimates required by ICES Fisheries Advice.
Resource requirements	The members of the core group of RDBES development are requested to participate and coordinate algoritm and code development ahead of the meetings. Participation of the ICES data centre is needed with regards to expertise in package development and maintainace.
Participants	The Group is normally attended by about 20 members. Participants should be proficient in writing own scripts and functions in R language and/or have good knowledge of survey sampling and estimation.
Secretariat facilities	None.

Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no direct linkages with ACOM, but most of the Stock Assessment Working Groups will be impacted by the development of the RDBES.
Linkages to other committees or groups	There is a direct link to WGRDBESGOV, the RDBES core group and close links to activities of WGTAFGOV, WGQUALITY, WGCATCH and WGBYC. There is an indirect link with WGRFS and WGBIOP.
Linkages to other organizations	The RDBES estimates are connected to regional data collection defined by the RCGs under the European Commission. The RDBES will also support the ICES countries in providing data for both national and international assessments and optimizing their sampling programmes. In the case of EU MS, the RDBES is expected to facilitate and improve the quality of provision of commercial catch data requested under different data calls.

Workshop 3 on age reading of blue whiting (*Micromesistius poutassou*) (WKARBLUE3)

2020/WK/DSTSG08 Workshop 3 on age reading of blue whiting (*Micromesistius poutassou*) (WKARBLUE3), chaired by Jane Aanestad Godiksen*, Norway, and Patrícia Gonçalves*, Portugal, will be established and meet online, 31 May–4 June 2021 to:

a) Review new information from validation study on first annual ring identification from daily increments; (Science Plan codes: 3.1, 5.1);
b) Review otolith growth table made by IPMA after WKARBLUE2 for ageing of blue whiting; (Science Plan codes: 3.3, 4.1);
c) Clarify the interpretation of annual growth rings (1-3) by sex, quarter, and age through image analysis (measurements of ring distances and back-calculation); (Science Plan codes: 3.1, 3.3, 4.1, 4.4, 5.1, 5.2);
d) Update on guidelines and common ageing criteria. With an emphasis on testing the scheme made by WKARBLUE1; (Science Plan codes: 3.3, 4.1, 5.1);
e) Increase existing reference collections of otoliths and improve the existing database of otolith images; (Science Plan codes: 3.1, 3.2, 4.1);
f) Analyse the age reading quality from the exchange using the 3-point scale of the image (mentioned in WKNARC); (Science Plan codes: 3.1, 3.2, 3.3, 4.1);
g) Address the generic ToRs adopted for workshops on age calibration (see 'WGBIOP 2019 Guidelines for Exchanges And Workshops on Age Reading'); (Science Plan codes: 3.1, 3.2, 5.1, 5.2).

WKARBLUE3 will report by 31 August 2021 for the attention of DSTSG and ACOM.

Supporting information

Priority	Age determination is an essential feature in fish stock assessment to estimate the rates of mortality and growth. In order to arrive at appropriate management advice, ageing procedures must be reliable. Age data are provided by different laboratories and countries using internationally agreed ageing criteria. It is necessary to continue to clarify the guideline of age interpretation. Therefore, otolith exchanges should be carried out on a regular basis, and if serious problems exist age reading workshops should be organised to solve these problems.
Scientific justification	The aim of the workshop is to identify potential problems in *Micromesistius poutassou* age determination, assess variability of growth patterns among different ecosystems, improve the accuracy and precision of age determination, and share the methods and procedures used between different ageing laboratories.

	An otolith exchange was made in 2020 and at WKARBLUE3 results from this otolith exchange will be presented and discussed. Because of the poor precision of age determination resulting from the exchange, presentation of validation studies will be encouraged for the workshop.
Resource requirements	No specific resource requirements beyond the need for members to prepare for and participate in the meeting.
Participants	Given its relevance to the EU Data Collection Framework (DCF) and the ICES quality assurance process, the workshop is expected to attract interest from the ICES Member States. The workshop tries to bring together international experts on blue whiting age reading and fish growth and scientists involved in stock assessment to assess the accuracy and precision of the age determination.
Secretariat facilities	SharePoint access, remote meeting facilities, SO support for online meetings.
Financial	None.
Linkages to advisory and science committees	ACOM, SCICOM.
Linkages to other groups	WGBIOP, WGWIDE, RCGs.
Linkages to other organizations	There is a direct link with the EU DCF.

Workshop 2 age reading of Sea bass (*Dicentrarchus labrax*) (WKARDL2)

2020/WK/DSTSG09 Workshop 2 age reading of Sea bass (*Dicentrarchus labrax*) (WKARDL2), chaired by Valerio Visconti*, United Kingdom, and Mary Brown*, United Kingdom, will be established and meet online 7–9 June 2021 to:

a) Clarify the interpretation of annual growth rings using stained otolith sections and scales on the same fish; (Science Plan codes: 3.1, 3.2, 5.2);

b) Continue the guidelines and common ageing criteria; (Science Plan codes: 3.1, 3.2, 5.2);

c) Develop existing reference collections of calcified structures and improve the existing database of scales images; (Science Plan codes: 3.1, 3.2, 5.2);

d) Address the generic ToRs adopted for workshops on age calibration (see 'WGBIOP 2019 Guidelines for Exchanges And Workshops on Age Reading'); (Science Plan codes: 3.1, 3.2, 5.2).

WKARDL2 will report by 15 August 2021 for the attention of DSTSG and ACOM.

Supporting information

Priority	Essential. Age determination is an essential feature in fish stock assessment to estimate the rates of mortalities and growth. Age data are provided by different countries and are estimated using international ageing criteria. It is necessary to continue to clarify this guideline of age interpretation. In 2019, an otolith and scale exchange programme was held for the purpose of inter-calibration between ageing labs. Results of this otolith exchange will be discussed during WKARDL2.
Scientific justification	The aim of the workshop is to identify the current ageing problems between readers and standardize the age-reading procedures in order to improve the accuracy and precision in the age reading of this species.
Resource requirements	Support for setting up online meeting.

Participants	In view of its relevance to the Data Collection Framework (DCF), and ICES WG, the Workshop will try to join international experts on growth, age estimation and scientists involved in assessment in order to progress towards a solution.
Secretariat facilities	None.
Financial	None
Linkages to advisory and science committees	ACOM, SCICOM.
Linkages to other groups	WGBIOP, WGBIE, WGCSE.
Linkages to other organizations	None.

Working Group on Biological Parameters (WGBIOP) *(pending approval)*

2020/FT/DSTSG10 The **Working Group on Biological Parameters** (WGBIOP), chaired by Annelie Hilvarsson*, Sweden, Maria Cristina Follesa*, Italy, and Sally Songer*, United Kingdom, will work on the ToRs and generate deliverables as listed in the tables below.

	Meeting dates	Venue	Reporting details	Comments (change in chair, etc.)
Year 2021	04–08 October	Online meeting	Interim report by 15 November to DSTSG	
Year 2022	To be determined	To be determined	Interim report by TBD to DSTSG	
Year 2023	To be determined	To be determined	Final report by TBD to DSTSG	

ToR descriptors

ToR	Description	Background	Science plan codes	Duration	Expected deliverables
a	Plan and prioritise validation studies, workshops, and exchange schemes on stock-related biological variables, and review the results.	Reviewing and prioritisation of the many incoming suggestions for workshops and exchanges from EGs, WKs, and other ICES related groups (e.g. planned benchmarks). It is essential to streamline this work with the ICES benchmark schedule.	3.1 and 3.2	Generic	Annual prioritised overview of planned studies, workshops, and exchanges. Update and restructure the Data Quality Assurance Repository (with ICES and WGQUALITY). Work with SID (Stock Information Database) developers to include workshop and validation study information in SID, to make this information available to the wider ICES community.
b	Improve training and quality assurance of age reading and maturity staging,	Guidelines for international calibrations are available, but methods, routines, and protocols for	3.1 and 3.2	Generic	Review the current national procedures for quality assurance.

ToR	Description	Background	Science plan codes	Duration	Expected deliverables
	and other biological parameters.	monitoring the quality of age and maturity on national levels needs to be standardized. International agreed to advice on targets (by stock) for accuracy of delivered biological data as input for assessments. If target is not met, validation should be prioritised.			Outline best practice guidelines in cooperation with the RCGs. Preparing guidelines for method standardization and implementation in cooperation with WGSMART. Continuous monitoring of the implemented standardized guidelines. Stock-specific targets for validation and accuracy of biological parameters achieved from exchanges and workshops. Liaise with WGALES on requirements for egg and larvae quality assurance.
c	Evaluate the quality of biological parameters: Issues and review of quality of biological parameters used in assessments.	It is essential that the time series of biological parameters used in stock assessments are of the highest quality. Guidelines for quality assurance of biological parameters have been developed in WGBIOP's previous terms. WGBIOP will collate information on quality assurance and accuracy estimates of biological parameters used, to evaluate if improvements can be achieved.	3.1, 3.2, and 5.1	3 years	Evaluation of issues put forward by the assessment WGs for benchmark species in 2021–2023. Review use of SID in delivering issue lists for upcoming benchmarks and provision of WGBIOP information to the assessment groups. Interactive quality indicator form for biological parameters used in assessments. Evaluate quality and accuracy estimates of biological parameters currently used in assessments.
d	Investigate and develop data availability, documentation, and methods to improve identified biological parameter estimates as input to assessment models.	Life-history parameters are required by expert groups on assessment, multi-species modelling, ecosystem modelling, and data-limited stocks. Therefore, recent data from quality assured sources is essential. WGBIOP provides guidelines for collecting high-quality data and provides links between data providers and end-users. There is a need to assess the availability and use of	3.1, 5.2, and 6.6	3 years	Document current sources of life-history parameter estimates identified by ICES/GFCM expert groups as critical components relevant to the improvement of assessment for ICES/GFCM stocks. Identify where biological information can be updated, provide input for improving reference points. Overview of quality assurance for stomach sampling.

ToR	Description	Background	Science plan codes	Duration	Expected deliverables
		biological parameters, and to support incorporating age error matrices and other biological parameter quality information into assessments.			Facilitate closer links between data providers and end-users. Liaise with WGQUALITY, benchmark groups, and developers on providing and implementing age error information in assessments.
e	Across database developments combining biological parameter data collection and quality assurance of this data. Address requests for technical and statistical recommendations/advice related to biological parameters and indicators.	WGBIOP regularly receives requests related to (quality of) biological parameters from EGs and other related groups. Filled templates for requests sent to WGBIOP before a specified deadline will be the basis for this ToR. Requests often deal with provision of information or data on the quality of biological parameters which are not easily accessible. To improve the accessibility of the data and the efficiency of the quality assurance processes, cross-database developments are essential. This will allow for combining data from different sources, facilitating the work of WGBIOP and also supporting the ICES quality management system	3.1, 3.2, and 3.3	Generic	Each received request for technical and statistical recommendations related to biological parameters and indicators will be addressed and included in the WGBIOP work plan where appropriate. Provide input for current and developing data storage and tools. Provide a flow diagram, combining outputs from SmartDots and RDBES/TAF/DATRAS to WGQUALITY, DIG and DSTSG. This will give an overview of countries/institutes collecting biological parameter data as input for quality assurance of biological parameters.
f	Provide feedback and guidance on updating and developing tools for exchanges and workshops on biological parameters.	Based on feedback from users of these tools and end-users of results of workshops and exchanges, improvements and alterations will be suggested and evaluated.	3.1 and 4.1	Generic	Annual updates and developments of tools will be evaluated based on end-user needs. Annual overview of suggested improvements based on the needs of users will be provided to governance groups (e.g. WGSMART).

Summary of the work plan

Year 1	Investigation of data availability and quality of life-history parameters and providing links between data providers and end-users. Evaluating the quality of biological parameters used in assessments. Improving quality assurance of biological parameters provided for assessments and management processes. Providing feedback and guidance on the development of

	tools for calibration workshops of biological parameters. Scheduling of exchanges, workshops, and validation studies aligned with the benchmark cycle.
Year 2	Investigation of data availability and quality of life-history parameters and providing links between data providers and end-users. Evaluating the quality of biological parameters used in assessments. Improving quality assurance of biological parameters provided for assessments and management processes. Providing feedback and guidance on the development of tools for calibration workshops of biological parameters. Scheduling of exchanges, workshops, and validation studies aligned with the benchmark cycle.
Year 3	Reviewing the status of issues, achievements, and developments concerning biological parameters and quality assurance of life-history parameters provided for assessment and management processes. Reviewing tools and database developments for providing and accessing biological parameters information. Identify future needs in line with ICES objectives, the ICES Science Plan, and the wider marine environmental monitoring and management within Europe, and propose a future/alternative work plan improving quality assurance of biological parameters.

Supporting information

Priority	The main objective of WGBIOP is to support the development and quality assurance of regional and national provision of biological parameters as reliable input data to integrated ecosystem stock assessment and advice, while making the most efficient use of expert resources. As biological parameters are among the main input data for most stock assessments and mixed fishery modelling, these activities are considered to have very high priority.
Resource requirements	None.
Participants	All National Age Reader/Maturity Stager Coordinators (ICES and GFCM) will be invited. Experts relevant to the current benchmarks of the year of WGBIOP will be invited as well as relevant external experts such as statisticians or specific EG members.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory and science committees	WGBIOP supports ACOM and SCICOM by promoting improvements in the quality of biological parameters from fishery and survey data underpinning the integrated ecosystem assessment approach.
Linkages to other groups	WGBIOP links with the SCICOM/ACOM Steering Groups: Data Science and Technology Steering Group (DSTSG) and Ecosystem Observation Steering Group (EOSG), and the Working Group on the Governance of Quality Management of Data and Advice (WGQuality). It links to stock assessment EGs and benchmark assessment groups by providing input on the data quality. WGBIOP also has links to the Regional Database Steering Group (SCRDB). WGBIOP also has links with WGSMART for the development of SmartDots and WGALES for quality assurance of ichthyoplankton parameters.
Linkages to other organizations	Regional Coordination Groups (RCGs).

Workshop 2 on age reading of North Sea plaice (*Pleuronectes platessa*) (WKARP2) *(draft)*

2020/WK/DSTSG11 The **Workshop 2 on age reading of North Sea plaice (*Pleuronectes platessa*)** (WKARP2), chaired by Ulrika Beier*, Netherlands, and Julie Coad Davies*, Denmark, will be established and meet online 26–28 October 2021 to:

a) Review results and outcomes of the 2020 North Sea Plaice exchange (SmartDots ID 281); (Science Plan codes: 5.1, 5.2);
b) Review and compare existing methods for age reading of North Sea plaice (Science Plan codes: 5.1, 5.2);
c) Review information on age estimations, otolith exchanges, workshops, and validation work done so far; (Science Plan codes: 5.1, 5.2);
d) Review existing guidelines and ageing criteria and compile an updated age reading manual with reference image sets; (Science Plan codes: 5.1, 5.2);
e) Address the generic ToRs adopted for workshops on age calibration; (Science Plan codes: 5.1, 5.2).

WKARP2 will report by [TBD] for the attention of DSTSG, WGBIOP, and WGSMART.

Supporting information

Priority	Age determination is essential in fish stock assessment where estimates of growth and mortality rates are utilised in the models. Reliable age estimates are thus required to support suitable management and advice procedures. Age data are provided by national laboratories using internationally agreed ageing criteria and it is necessary to ensure that guidelines and criteria are agreed upon and followed. Therefore, otolith exchanges should be carried out on a regular basis and if reoccurring problems exist then an age reading workshop should be organised to address and solve these issues.
Scientific justification	The general aim of the workshop is to standardise the age determination criteria followed in national age reading laboratories and to identify and address existing and potential problems in the age determination of *Pleuronectes platessa*. Examination of levels of accuracy and precision across readers and laboratories is required to improve the quality of the age data as input into stock assessment models. Analysis of the variability in the growth patterns observed in the otoliths can support the age determination process and provide biological parameter-related information relevant to the stock assessment. Validation studies based on these patterns can result in a true age determination and a review of validation studies to date will be made. The results of the 2020 North Sea plaice age reading exchange will be presented and discussed and will form the basis of an analysis of the most suitable method for age reading of North Sea plaice.
Resource requirements	No specific resource requirements beyond the need for participants to prepare for and partake in the meeting.
Participants	Given its relevance to the EU Data Collection Framework (DCF) and the ICES quality assurance process, the workshop is expected to attract interest from ICES Member States. The workshop aims to bring together international experts on plaice age reading and scientists involved in assessment in order to assess the accuracy and precision of the age data used as input into stock assessment.
Secretariat facilities	Report formatting and online meeting coordination.
Financial	No financial implications.
Linkages to advisory and science committees	ACOM.
Linkages to other groups	WGBIOP, WGSMART.
Linkages to other organizations	There is a direct link with the EU DCF.

Resolutions approved in 2018

Working Group on SmartDots Governance (WGSMART)

2018/MA2/EOSG01 The **Working Group on SmartDots Governance**[2] (WGSMART), co-chaired by Julie Coad Davies* (Denmark) and Jane Aanestad Godiksen* (Norway), will meet intersessionally, 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.

	WEBEX Meeting dates	Meeting dates and Venue	Reporting details	Comments (change in Chair, etc.)
Year 2019	1) 7 February 2) 25 April 3) 12 September 4) 14 November	11-12 October Lisbon, Portugal (Venue as WGBIOP)	Interim report by 8th November to EOSG	
Year 2020	1) 14 January 2) 21 April 3) 12 May 4) 23 October	8 September and 26 November (Online meetings)	E-evaluation	Agreed upon at WGSMART October 2019 meeting that WGSMART will meet before WGBIOP 2020 and proposes that the first day of WGBIOP is dedicated to overlapping work of WGSMART and WGBIOP
Year 2021	1) 11 January 2) 11 May 3) 2 September 4) 12 October	24-25 November (Online meeting)	Final report by 6 January 2022 to DSTSG	If the approach taken in 2020 works then this will be followed in 2021

WGSMART will report on its activities by the March SCICOM meeting the following year to DSTSG and DIG.

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Oversee and advise on the interpretation and prioritisation of recommendations and requests addressed to WGSMART	SmartDots is an operational tool that aims to improve the overall quality of age data delivered to assessment EG's. The tool is now operational and an integral part of the ICES QAQC for aging many fish species for which ICES provides advice, procedure largely under the guidance of WGBIOP. However	3.1, 4.1	3 years/ Generic ToR	A prioritised list of SmartDots related expert group recommendations with a proposed annual work plan to address concerns and implement improvements to SmartDots.

[2] http://ices.dk/marine-data/tools/Pages/smartdots.aspx

		maintenance and future development of the platform are beyond the scope of the scientific WG's and WK's.			
b	Provide a platform for end user feedback to the SmartDots system. User feedback will be requested from the end users via the GitHub site, exchange/workshop reports, EG'S and committes. Feeback will be compiled by WGSMART and appropriate actions to be taken with assigned responsibilities will be listed and prioritised.	SmartDots will be further developed to meet the requirements of a broad range of end users and thus needs to be responsive to user feedback. This feedback system needs to be independent of WGBIOP as a greater responsiveness (more than one meeting a year) is required to manage the system effectively.	3.1, 4.1	3 years/Generic ToR	
c	Elaborate a forward plan for the sustainability of SmartDots as a platform	To achieve a continous quality, SmartDots needs to be developed in line with end users needs. This development requires an input of resources; knowledge, expertise, manpower and funding over a period of time which extends beyond the initial phase. A workplan with clear objectives and milestones can only be sucessfully implemented when the availability of such resources is clear.	4.4, 3.6	3 years/ Generic ToR	A workplan outlining what resources are required for development, support, training and dissenimation of relevant information. An estimated budget including identified funding resouces.
d	Oversee development of user guidance and training in SmartDots	As SmartDots develops overtime a range of users will require various levels of training including step by step user manuals, tutorials and possibly workshops. Documentation of guidelines and procedures in line with WGBIOP will also be necessary. Outreach activities will be required.	3.1, 4.1	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

In addition to the ongoing maintenance and improvements by the end of year three we aim to have; the data output and reporting module fully operational, SmartDots maturity staging module fully operational and user manuals updated in line with all developments made.

Year 1	ToR a) and b) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with WGBIOP and prioritising ToRs c) and d).
Year 2	ToR a) and b) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with WGBIOP and prioritising ToRs c) and d).
Year 3	ToR a) and b) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with WGBIOP and prioritising ToRs c) and d).

Supporting information

Priority	
Resource requirements	A commitment of time from the members of the group consistent with progressing actions identified in the quarterly meetings
Participants	Chair of WGBIOP, one member from each country from the core development group (BE, DK, NO), ICES Secretariat as hosts of International SmartDots, other WGBIOP 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 very close working relationship with WGBIOP. There is a strong linkage to DIG as the main umbrella for data/software governance structures.
Linkages to other organizations	EU Commission has partially funded SmartDots and is therefore following its progress, GFCM in the Mediterranean also has interest in this system

Working group on machine learning in marine science (WGMLEARN)

2018/MA2/EOSG06 A **Working group on machine learning in marine science (WGMLEARN)**, chaired by Ketil Malde, Norway, and Jean-Olivier Irisson, France. The group will work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2019	22-24 May	Ostend, Belgium	Interim report by 1 July, 2019	
Year 2020	1-2 December	Online meeting	Interim report by 14 January, 2021	
Year 2021	25-26 and 28-29 October	Online meeting	Final report by 10 December, 2021	

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Review 1) new method developments in machine learning, 2) current applications of machine learning methods in marine science, and 3) their implementations and deployments in advisory and scientific processes.	Machine learning holds great potential, but it is necessary for practitioners to keep up with new developments and to gain an understanding of the opportunities and challenges with new methods.	4.1, 4.5, 3.2	1, 2, 3	On-line (live) report
b	Invite presentations (externally and internally) and review data or analysis challenges in order to discuss possible methods, approaches and technologies.	ML experts need to meet with stakeholders and data collection efforts for mutual understanding of data analysis challenges.	4.2, 4.3	1, 2, 3	On-line list of challenges
c	Communicate with DIG and the ICES Data Centre on data organization and requirements related to machine learning analysis.	For effective deployment, ML has to be integrated with data collection and data management efforts.	4.2	1, 2, 3	
d	Summarize current and future needs in marine science and identify how machine learning methods can provide solutions. Work actively to promote adoption of relevant technologies.	Future developments in the marine sciences, including project proposals, need to have an informed and up to date view of the state of the art, in order to make optimal use of the technology.	4.2, 4.3	3	

Summary of the Work Plan

Year 1	Produce the annual overview of recent developments.
Year 2	Produce the annual overview of recent developments.
Year 3	Produce the annual overview of recent developments.

Supporting information

Priority	Machine learning is a prioritized topic by DIG, and was explored in the WKMLEARN workshop in April 2018, on an initiative by ACOM. The workshop highlighted a need for a centrally organized venue to share methods and best practices between researchers, to attract outside expertise, and to support publication and disemmination of results. Long term engagement is especially needed to support deployment and integration of the new methods.
Resource requirements	The research programmes which provide the main input to this group are already underway, and ressources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	Machine learning is a topic of considerable and broad interest, and is likely to attract participants from outside the traditioal ICES organization. We expect some 30 members, similar to the attendance of the WKMLEARN workshop.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	DIG (Julie could you check does DIG sit under ACOM?, certainly they go to the SCICOM meetings), ICES Data Centre (also I think this sits under the secretariat rather than ACOM), could just be moved to the section below if we are not sure
Linkages to other committees or groups	Close working relationships with other groups that terget data collection or analysis. Relevant examples are: WGFTFB (targets non-destructive fisheries sampling) WGNEPS (video surveys to monitor nephrops populations) WGFAST (analysis of acoustics data) WGBIOP and WGSMART A planned WG for electronic monitoring of vessels
Linkages to other organizations	Machine learning is a prioritized topic by DIG, and was explored in the WKMLEARN workshop in April 2018, on an initiative by ACOM. The workshop highlighted a need for a centrally organized venue to share methods and best practices between researchers, to attract outside expertise, and to support publication and disemmination of results. Long term engagement is especially needed to support deployment and integration of the new methods.

Working Group on Technology Integration for Fishery-Dependent Data (WGTIFD)

2018/MA2/EOSG08 The **Working Group** on **Technology Integration for Fishery-Dependent Data (WGTIFD)**, co-chaired by Brett Alger, United States and Lisa Borges, Portugal will work on Terms of Reference (ToRs) and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2019	7-9 May	ICES HQ, Denmark	Interim report by 21 June to ACOM/SCICOM	Year 2019
Year 2020	6-8 October	Online meeting	Interim report by 20 November to ACOM/SCICOM	Year 2020
Year 2021	29 November - 3 December	Online meeting	Final report by Date Month to ACOM/SCICOM	Year 2021

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Inventory and review the various national fisheries dependent hardware and software applications and approaches highlighting synergies and similarities with an aim to improve cooperation and collaboration. Indicate readiness states, availability and development plan including scientific training dataset availability.	As a new WG, it is imperative to initially assess the technologies currently available and in development, the objectives of the schemes under which they are deployed in fisheries and scientific research, what data is being collected and by whom. This TOR will build upon a forthcoming paper examining REM use around the globe, to include other technologies currently deployed in fisheries	4.1, 4.5	Year 1	Draft a review paper for publication in a peer-reviewed journal.
b	Define consistent vocabulary across approaches and develop communication strategies for attracting participation in voluntary programs, and deploying and implementing electronic technologies for fisheries dependent observation.	There are a range of terms and perspectives on monitoring technologies, and a perception by some that cameras are on vessels for purely enforcement purposes. While we do not need to standardize terms, this TOR will help us better understand one another's terms, appreciate challenges for gaining participants, and collectively communicate that the primary goal of monitoring technologies is fisheries data collection.	4.1, 4.5	Ongoing	Incorporate general terms and communication strategies for writing regulations, technical documents, and various forms media. Include section in first working group report documenting use of terminology
c	Evaluate risks and benefits of technologies across different fisheries and data requirements to establish methodological acceptance for science and management.	There are many choices in designing a monitoring program, including hardware, software, data transmission, and other technical aspects. Additionally, it can be challenging to incorporate data from new sources into existing monitoring programs and stock assessments. This TOR is a handbook for those designing/redesigning their programs that illustrates	3.5, 4.4	Year 3	ICES Cooperative Research Report on best practices

		how to integrate new information of comparable accuracy/precision and quality with data collected through traditional means.			
d	Develop tools and innovative strategies for collecting, handling, processing and analysing fishery-dependent data from electronic technologies	Many technologies are being deployed alongside one another (e.g., VMS, electronic logbooks, and REM). This TOR will examine how to integrate the many data collection technologies in a single approach to ease the reporting burdens and costs of data collection, reduce duplication of effort.	4.2, 4.3	Year 3	Section of working group report providing technical guidelines on integration of fishery-dependent data from various sources in a consistent manner.
e	Report on developments in machine learning and computer vision technologies and their applications in fisheries dependent data collection and cooperate with WGMLEARN on methodological advances and communicate with WGMLEARN on the topic.	The field of computer vision and machine learning is rapidly advancing in fisheries. This TOR will be examined at each working group meeting and other opportunities of engagement to ensure our working group products reflect current applications	4.3, 4.4	Ongoing	Produce a peer-reviewed paper summarising the state of the art in year 3.
f	Organize a session at ICES ASC			Year 2	Topic session in 2020

Summary of the Work Plan

Year 1	Produce an annual overview of the working group's progress
Year 2	Produce an annual overview of the working group's progress
Year 3	Produce a final report on the working group's progress and completed TORs

Supporting information

Priority	Fisheries stakeholders and managers are looking to improve the timeliness, quality, cost effectiveness, and accessibility of fishery-dependent data by integrating innovative technology into monitoring programs. Remote electronic monitoring (REM) has clear potential to meet these challenges by incorporating cameras, gear sensors, and electronic reporting (ER) into fishing operations. We believe that ICES can provide a forum for exchanging information to share relevant technical applications and policy development to harmonize how data is collected and used for fisheries management and science.

Resource requirements	None to ICES, nationally the programs that will provide input to this group are established, there is no need for additional resources.
Participants	Electronic monitoring is a growing topic of interest, with programs in every Region in the United States and the EU. We expect an initial working group to consist of 20-30 people, with expansion into other parts of the globe growing the group to more than 50.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	
Linkages to other committees or groups	WGMLEARN, WGCATCH, WGFAST, PGDATA WGSFD, WKSEATEC ICES Data Centre, DIG
Linkages to other organizations	

Working Group on Atlantic Larval and Egg Surveys (WGALES)

2018/2/EOSG16 The **Working Group on Atlantic Larval and Egg Surveys (WGALES)** chaired by Patrick Polte, Germany, Richard D.M. Nash, Norway (to be replaced in 2020), and Cristina Nunes*, Portugal (from 2020) will work on ToRs and generate deliverables as listed in the Table below

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2019		By correspondence		
Year 2020	19–21 October 2020	Online meeting	E-evaluation	Richard D.M. Nash replaced by Cristina Nunes
Year 2021	27-28 October	Online meeting	E-evaluation	
Year 2022	October	TBD	Final report by 15 December	

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Review the current ichthyoplankton surveys in light of their original purposes, with respect to design, estimation methods and challenges and identify their potential for other purposes such as ecosystem surveys.	Ichthyoplankton surveys collect abundance data on early life history stages useful for estimating fish standing stock biomass (SSB) and recruitment of several fish stocks.	1.4, 2.2, 3.2	year 2, 4	
b	Survey scientist work together to evaluate and recommend methodologies and research needs	Ichthyoplankton surveys need to keep pace with developing data needs	1.4, 3.2, 4.4	year 2, 4	

	for sampling, processing and data analyses for ichthyoplankton surveys, concerning the Early life history stages and the contributions from the adult components. WGALES also offers the possibility for data users to gain insights into the rationale, methodology and potential applications of fish early life stage ecology (and adult fish maturity) research.	and technological developments. The provision of a workshop/conference environment provides a forum for improvement, development of new ideas and innovative insights for these surveys.			
c	Present and report on reproductive dynamics and fish early life strategies relevant for ichthyoplankton surveys	Successful surveys are dependent on understanding the life-history dynamics of the target organisms and understanding how this may change with ecosystem vaiability and change.	1.7, 2.2, 3.2	year 2, 4	
d	To work together with ichthyoplankton data providers and experts to evaluate and improve surveys. This will include collaboration across members in several ICES groups including IBTSWG, WGACEGG, WGMEGS, WGSINS (WGEGGS2).	Specialist working groups need a forum with experts from other types of ichthyoplankton surveys and personnel working in different areas to seek guidance and advice.	2.3, 3.2, 3.4	year 1, 2, 3, 4	
e	Provide a standardized framework for ichthyoplankton data bases and facilitate implementation of new survey data into the ICES egg and larvae data base in collaboration with the ICES Data Center.	Ichthyoplankton data needs to be of high quality and centrally available for the assessment working groups and the science groups more generally to do their work and demonstrate transparent ways of working.	3.2, 4.2	year 1, 2, 3, 4	Updated dataset on the ICES egg and larval database

Summary of the Work Plan

Year 1	WGALES will communicate by correspondence to act upon urgent ToR's from ichthyoplankton survey groups (ToR d)
Year 2	WGALES will meet to address ToRs a, b, c, d, e, f

Year 3	WGALES will communicate by correspondence to act upon urgent ToR's from ichthyoplankton survey groups (ToR d)
Year 4	WGALES will meet to address ToRs a, b, c, d, f
	This Working Group meets every two years with a meeting format that covers general matters concerning ichthyoplankton surveys (ranging from new innovations in survey equipment and design through considering current ichthyoplankton surveys and their protocols) and also includes a specialised theme session or two on current and innovative relevant topics. The new topics are chosen at the end of each meeting to allow participants to work on them in the period between meetings. As such, new meeting ToRs can arise every two years to provide a focus for part of the biannual meeting.

Supporting information

Priority	The activities of WGALES are vital for the delivery of state-of-the-art ichthyoplankton surveys, ensuring high standards and incorporating new techniques and developments for the future. WGALES will lead to the cross fertilization of ideas, methodologies, developments and standardization of ichthyoplankton surveys in the ICES area. Hence providing a platform from which to improve the assessments based on the ichthyoplankton surveys.
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed.
Participants	The Group will be attended by members of ICES groups, WGMEGS, WGEGGS2/WGSINS, IBTSWG, WGACEGG and guests carrying out ichthyoplankton surveys in the non-ICES areas. The Group is normally attended by some 25–30 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are linkages with ACOM through the individual ichthyoplankton surveys groups that are associated with WGALES and their assessment groups that use plankton data.
Linkages to other committees or groups	There is a close working relationship with the all the ICES expert groups of ichthyoplankton surveys, WGMEGS, WGEGGS2/WGSINS, IBTSWG, WGACEGG and their assessment groups, WGWIDE, HAWG, WGHANSA.
Linkages to other organizations	No formal linkages.