Human Activities, Pressures and Impacts Steering Group EGs Resolutions

Resolutions approved in 2019

Working Group on Introduction and Transfers of Marine Organisms (WGITMO)

2019/FT/HAPISG01 The **Working Group on Introductions and Transfers of Marine Organisms** (WGITMO), chaired by Cynthia McKenzie, Canada, will work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2020	4–6 March	Gdynia, Poland		Joint meetings with WGBOSV and WGHABD
Year 2021				
Year 2022			Final report by 15 June to SCICOM	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Advance research, develop collaborations and address surveillance and knowledge gaps in issues related to the introduction and transfer of marine organisms, through annual reviews of national/international activities and responding to advice requests.	Data, information and knowledge collated and synthesised ensures timely update of AquaNIS as well as national and international databases as appropriate. This information will be used as an underlying information source for other ToRs, responding to incoming advice requests as well as organising collaboration with other international science organisations (e.g. PICES and CIESM).	2.1, 2.4, 3.3	3 years	Annual reports to ICES. Further develop and advance AquaNIS database, and populate it with new data. Respond to incoming advice requests as requested.
b	Evaluate the impact climate change may have on the introduction and spread of non-indigenous marine organisms, including Arctic environments.	This work will be carried out jointly with WGBOSV. Contributes to SICCME and ICES high-priority action areas 'Arctic research'.	2.5, 2.2, 3.6	3 years	Primary publication on the Arctic environment and the spread of non-indigenous species.
c	Investigate biofouling as a vector for the introduction and transfer of aquatic organisms on vessels and artificial hard structures, their pressure and impact on the ecosystem with a comparison of prevention or selective mitigation	Biofouling has been increasing recognized as an important vector in the introduction and transfer of aquatic organisms. Elements of this work will be carried out jointly with WGBOSV as a comparison vector in invasion pathways. Biofouling is an increasing concern for aquaculture, energy installations, and	2.7, 2.1, 6.4	3 years	Input on the general applicability of preventive measures and selective mitigation technologies through a technical paper or manuscript submitted to a peer-reviewed scientific journal. Input to IMO Biofouling guidelines.

	methodologies.	coastal development as stressors on coastal environments.			
d	Advance knowledge base to further develop indicators to evaluate the status and impact of non-indigenous species in marine environments	The aim is to develop a wider knowledge-base to more effectively address several legislative acts related to introductions of non-native species, such as EU IAS Regulation and EU MSFD (D2). Specifically, WGITMO aims to improve/develop metrics and critically evaluate the underlying uncertainties, including the on-going global trial of the Aquatic Species Invasiveness Screening Kit (AS-ISK) and a comparison of AS-ISK and the Canadian Marine Invasive Species Tool (CMIST).	2.2, 2.7, 6.1	3 years	At least one manuscript to be submitted to a peer-reviewed scientific journal.
e	Evaluate the development and utilization of DNA- and RNA-based molecular approaches to provide science-based tools for strategic planning, policy development, and operational processes regarding non-native species and biological invasions (including detection and monitoring, reconstruction of patterns and vectors of introduction and spread, assessment of establishment and impact risk, and application for invasive species control)	Molecular (DNA-based and RNA-based) approaches have been increasingly used in the past decades to uncover cryptic introduced species, understand underlying processes of population establishment and spread, and detect novel introductions and monitor existing ones. Recent innovations have increased the power of these approaches to understand invasion risk and offer possibilities for novel biotechnological solutions for control or eradication of invasive populations. With the advent of recent technologies, it is timely to assess and evaluate their potential applications as well as their limitations.	2.5, 1.6, 4.4	3 years	Input on the effective utilization of these methods for international and national policies and regulations through meeting participation, group correspondence, and/or development of technical reports or peer-reviewed papers.
f	Investigate the role of human-produced marine debris as a vector and facilitator for the introduction and spread of non-indigenous species (NIS). Advance research and identify knowledge gaps on marine debris-NIS interactions (eg. Marine debris as a facilitator for jellyfish	The accumulation of debris in the ocean is severely affecting ocean and coastal ecosystems, as its ingestion and entanglement directly impacts marine organisms. Furthermore, recent research indicates that marine debris is both a growing vector for the introduction of non-indigenous species (NIS), with transoceanic rafting already likely to	2.5, 2.6, 2.1	3 years	Review paper on NIS introduced to European waters via marine debris

	blooms).	intensify species invasions worldwide and a potential facilitator of marine diseases. Develop collaborations with other working groups (HELCOM-TGML; OSPAR ICG-ML, ICES-WGML, MSFD-ML; PICES; CIESM)			
g	Investigate best practices to minimize the role of aquaculture as a vector for the introduction and transfer of non-indigenous aquatic organisms. This would include both non-indigenous species targeted for aquaculture and hitchhikers (biofouling and interstitial, parasites and pathogens). Impacts of non-indigenous species on aquaculture and on ecosystems will be addressed.	Aquaculture has been recognized as an important vector in the introduction and transfer of aquatic organisms. ENSARS provided some baseline information on aquaculture risk analysis, including development and global testing of ENSARS' derivative, the AS-ISK. There are important social and economic impacts (positive and negative) of introductions related to aquaculture. Linkages with aquaculture working groups, and WGPDMO will be sought as well as a close collaboration with WGECON.	2.1,2.2, 5.6	3 years	Input on the general applicability of preventive measures (good practice codes) and selective mitigation technologies through technical guidance and/or a peer-reviewed paper.

Summary of the Work Plan

Year 1	Work on all ToRs with special focus on a, c, e, f, g
Year 2	Work on all ToRs with special focus on a, b, d, e, f
Year 3	Report on All ToRs

Supporting information

Priority	The work of the Group forms the scientific basis for essential advice related to the introduction and transfer of marine organisms, particularly non-indigenous species. Consequently these activities are considered to have a very 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.
Participants	The Group is normally attended by some 40-50 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	The group will serve as primary respondents to incoming advice requests on various issues relating to introduction and transfer of marine organisms, including non-indigenous species.

Linkages to other committees or groups	There is a very close working relationship with the Working Group on Ballast Water and Other Ship Vectors (WGBOSV). In addition to relevance to the Working Group on Harmful Algal Bloom Dynamics (WGHABD), Biodiversity Science (WGBIODIV), and aquaculture focused working groups, WGITMO also contributes to Integrated Ecosystem Assessment EG's. Anticipate building linkages with the Working Group on Integrated Morphological and Molecular Techniques (WGIMT) during the next three years under these ToRs. Potential linkages with WGML, WGECON, WGPDMO.
Linkages to other organizations	PICES, CIESM, IMO, HELCOM, OSPAR

Working Group on Marine Planning and Coastal Zone Management (WGMPCZM)

2019/FT/HAPISG02 Working Group on Marine Planning and Coastal Zone Management (WGMPCZM), co-chaired by Andrea Morf, Sweden; and Catriona Nic Aonghusa*, 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 2020	20-24 April	by corresp/ webex		physical meeting cancelled - remote work
Year 2021		Netherlands (tbc)		
Year 2022		Copenhagen, Denmark (tbc)	Final report by *Date Month* to SCICOM	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Review and report on progress of marine planning (MSP) and coastal zone management (CZM) in ICES member states and inform activities in other ToRs and working groups, especially in relation to the following key aspects: 1. Addressing conflicts and	Many ICES countries' marine plans soon enter the implementation phase. Based on countries' global and regional commitments (e.g. Sustainable Development Goals, OSPAR, HELCOM, or the EU's Marine Spatial Planning Directive) both environmental, social and economic	2.7, 4.3, **6.2**, **6.3,** 6.4, 6.6, 7.2, 7.3, **7.4**[1]	Years 1,2,3	"ICES WGMPCZM Ambassador" guest lecturing module for WG members (year 1). Report or manuscript on the changes in evidence needed and other R&D requirements arising as planning

[1] **Comment on science priorities:** WGMPCZM suggests that the **science priorities in bold are included in the database.** WGMPCZM is working in a very cross cutting way across many of the science priorities.

	promoting synergies; 2. Treatment of culturally significant areas ; 3. Development and use of decision support tools; 4. Monitoring and evaluation approaches.	developments and their implications across the land sea interface in the seas need attention. Fast development of evidence, methods and practice is under way, but effective learning requires a systematic reflection and sharing across ICES countries and WGs. Science/ICES can facititate systematic reflection and enhance instituitonal learning. Several areas are presently of significance: 1. establishing effective, synergetic use of marine space and minimising conflicts, 2. Basic mapping and including of social and cultural dimensions, 3. Need for and occurring rapid development of decision support tools, 4. Driving ahead monitoring and evaluation of plans and planning.			practice evolves (year 3).
b	Define and report on the role of marine spatial planning (MSP) and coastal zone management (CZM) in facilitating marine and coastal ecosystem restoration.	Recognising biodiversity targets (SDG 14, CBD, Aichi agreement, etc.) and related concepts (natural capital, green infrastructure, habitat offsetting and managed realignment), MSP will become more important as a framework to deliver restoration and sustainable use.	6.1, **6.2**	Years 1,2,3	Workshop to review current problems of implementing restoration, relevant approaches & solutions and the (current and potential) roles of MSP/CZM (Y2) based on resolution to be formulated in Y1. Review paper and

					proposals for concepts and strategies (Y3).
c	Assess and provide guidance on how climate change (CC) is considered and incorporated in marine planning (MSP) and coastal zone management (ICZM).	Climate change and ocean acidification and their causes and effects include spatial dimensions in marine and coastal socio-ecological systems. Future CC-related impacts will require strategies and actions and related ICZM and MSP practice and method development will need to be pro-active.	**1.1, 1.3, 1.9**[2]	Years 1,2,3	Workshop to define best practice (Y2), based on stocktake report of relevant approaches and frameworks for CC in ICZM/MSP and a workshop resolution formulated in Y1. Guidance paper on how to improve current MSP/ICZM practice (Y3).
d	Review and report on transboundary issues and collaboration in planning, i.e the coastal zone, across sea basins and in areas beyond national jurisdiction, including the deep sea.	EEZ based MSP is under rapid development, but human activities, pressures and impacts cross jurisdictional (multi-level governance systems), sea basins and land-sea boundaries and need to be acknowledged and managed accordingly. The present, historically grown institutional systems, data collection and information flows are not necessarily suitable and need to be re-designed. Hence the on-going work to improe ocean	**6.2, 6.3**	Years 1,2,3	Synthesis report with a stocktake of reviews and problem analyses relating to MSP/ICZM addressing land-sea interactions and transboundary issues in marine basins, also taking into account insights from work on other ToRs (e.g. a, c; Y 3).

[2] Results from many sub codes within **code 1** can relate to CC but code 1 includes little on policy implications and translation into policy. This ToR tries to link results from work (also in other groups, if appropriate) with spatial management.

		governance from local to global level (e.g. UN BBNJ process.			
e	Develop educational/training materials to promote understanding of marine spatial planning (MSP) and coastal zone management (ICZM) processes: 1. Map and if possible address education and training needs for MSP. 2. Work with the ICES secretariate to develop and deliver training materials / courses as required. 3. Act as scientific steering group for the MSP Challenge serious game. 4. Promote MSP and ICZM processes as a platforms for enhancing Ocean Literacy within society.	Need for capacity development within ICES, science/practioners. Need to modernise marine graduate and postgraduate education and train current work force (authorities & consultancy). Low awareness and collaboration of dispersed, transitory initiatives (projects) but emerging courses on different levels. Need to network and create synergies across ICES countries and beyond, remaining country/region relevant. Building on earlier period's experiences with education and training develop relevant input to training (building on e.g. MSP Challenge).	**6.3, 6.4, 7.4** [3]	Years 1,2,3	Joint work session on board game organised by NL gov/IOC-UNESCO (training for trainers) (Y 1). "WG-MPCZM ambassadors" Guest lecturing module for WG members (Y 2). Chapter for MSP Challenge handbook on ICES knowledge and experience (Y 2). Joint WK MSP Challenge simulation platform with NL gov/Buas (Y 2). Continue to provide training based on needs as identified by ICES secretariate as before.
f	Assess and report on the social impacts of marine spatial planning (MSP) and integrated coastal zone management (ICZM) on coastal communities, with a focus on social costs and benefits including effects on well-being and equality.	The relationship between MSP/ICZM and the social dimensions of sustainable development are still comparatively underrepresented in research. At the same time, MSP/ICZM is increasingly recognised as a tool for achieving	6.3, **7.1, 7.5, 7.6**	Years 1,2,3	A stocktake report on current marine plans and their links to community well-being and equality (Y 1). A workshop to explore the various dimensions of community well-being, equality,

[3] There is less in the science plan on capacity building & training & activities and developing ICES science policy interface, but to us this appears highly important. So, this ToR is less based on the science plan but on the ICES vision and mission:
Vision= Be world-leading marine science organization, meeting societal needs for impartial evidence on the state and sustainable use of our seas and oceans
Mission= Advance & share scientific understanding of marine ES & ESS they provide & use knowledge to generate state-of-the-art advice for meeting conservation, management, and sustainability goals

	the SDGs (Agenda 2030), in particular for enhancing the well-being of (coastal) communities. Both the spatial dimensions of C/MSP (e.g. identifying and managing culturally significant areas) and process-related dimensions (e.g. inclusiveness, enhancing social cohesion, gender equality etc.), as well as vulnerabilities and risk-based perspectives (e.g. risks to culturally significant areas) must be considered if MSP/ICZM practice is to maximise its potential as tool for achieving SD.	associated vulnerabilities, and the opportunities and constraints for MSP/ICZM in enhancing community well-being (Y 2). A guidance paper on how to improve current MSP/CZM practice (Y 3)

Summary of the Work Plan

Year 1	**ToR A: Develop "ICES WGMPCZM Ambassador" lecturing module for WG members and and inform activities in other ToRs and working groups on relevant developments.** **ToR C: Stocktake of frameworks and approaches to deal with CC in C/MSP.** ToR E: Joint work session on board game organised by NL gov/IOC-UNESCO (training for trainers) ToR E: Provide training based on needs as identified by ICES secr. ToR F: Stocktake report on current marine plans and their links to community well-being and equality.
Year 2	ToR B: Review of current problems for implementation of restoration, approaches & solutions and the current/potential role of MSP/CZM through a workshop. ToR C: Workshop to define best practice in relation to how MSP/ICZM deals with CC. ToR E: "WGMPCZM MSP Challenge ambassadors" Guest lecturing module for WG members; ToR E: Chapter for MSP Challenge handbook on ICES knowledge and experience; ToR E: Joint WK MSP Challenge simulation platform with NL gov/Buas. ToR E: Provide training based on needs as identified by ICES secr. ToR F: Workshop to explore the various dimensions of community well-being, equality, associated vulnerabilities, and the opportunities and constraints for MSP/ICZM in enhancing community well-being (year 2).
Year 3	ToR A: Report or manuscript on the changes in evidence needed and other R&D requirements arising as planning practice evolves. ToR b: Review paper and proposals for concepts and strategies for ecosystem restoration through MSP/ICZM.

	ToR C: A guidance paper on how to improve current MSP/ICZM practice in relation to CC. ToR D: Synthesis report with a stocktake of reviews and problem analyses relating to MSP/ICZM addressing land-sea interactions and transboundary issues in marine basins, also taking into account insights from work from other ToRs (e.g. a, c). ToR E: Provide training based on needs as identified by ICES secrrtariat ToR F: Guidance paper on how to improve current MSP/CZM practice.

Supporting information

Priority	WGMPCZM activities cover many priorty areas within the ICES science plan and should therefore be of high to very high priority. The current activities of WGMPCZM are urgent in terms of a rapidly developing practice of MSP/ICZM and marine and coastal problems to address (Climate change, habitat loss, pressure on deep sea areas, current rapid devleopment of marine and coastal management institutions and related need for capacity development and institutional learning). The first three topics are included in the ICES science plan, but often lacking links to relevant R&D and capacity development in planning and management. We see important links to ICES initiatives and working groups working with CC, integrated ecosystem assessments, social dimensions, marine uses and pressures and would like to develop these. Here, it is also important, that this group is still rather unique within ICES as one one with a highly interactive science policy interface – ascertained through the composition of the group, including both researchers, planners and policy experts from various disciplines and fields of practice.
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are committed, so the additional resource required to undertake additional activities in the framework of this group is negligible. Here, we just list a number of relevant projects and initiatives for different ToRs. For ToR A, relevant projects include the BONUS projects BASMATI, the EU-EASME financed project Pan Baltic Scope and the NorthSEE project, the INTERREG CB project Plan4Blue INTERREG BSR project Baltic Rim, the Estonia-Russia programme 2014-2020 project ADRIENNE; as well as involvement of group members in the EU MSP Platform. There is also ongoing work on country MSP plans, plus increasing attention on evaluating existing plans in the course of their first revision. ToR B can profit from countries' activities related to implementation of SDG 14 and ecosystem based MSP and work with protected area networks in both the HELCOM and the OSPAR areas (including Ireland, Canada) and the Estonia-Russia programme 2014-2020 project ADRIENNE, ToR C can build on activities carried out by the LandtoSea project at HZG, as well as the ongoing relevance of climate-proofing MSP plans and studies carried out in various contexts. ToR D can profit from other ToR work and group members' involvement in the global IOC UNESCO MSP initiative. ToR E is linked to the continued activites around the development and testing of present and new versions of the MSP Challenge Serious Game (by its developers), and a ERASMUS university collaboration on teaching and training in MSP and ICES training. ToR F will mainly draw on the Land-to-Sea, SeaUseTip and CoastWise projects at HZG which collectively are dealing with ecosystem services, culturally significant areas, community benefits and social-cultural tipping points.
Participants	Group activities are normally attended by some 15–25 members and guests (out of ca 60 appointed and chair-invited members).
Secretariat facilities	Depending on ToR and whether meetings occur in Copenhagen we need to rely on the secretariate.

Financial	No financial implications.
Linkages to ACOM an groups under ACOM	There are no obvious direct linkages at present (related to on-going tasks), but there is a potential to develop advice on MSP and ICZM – if requested by someone and fitting the group's ToRs, competence profile and if relevant experts are available.
Linkages to other committees or groups	There is a need for working relationships with other groups, both as needs arise, but also more continuously. This includes not the least SIHD and WG SOCIAL and groups within HAPISG dealing with societal aspects and human activities in the sea, but also groups working on habitats (Torb), integrated ecosystem assessments and on climate change (ToRc). There is also a proposal for a new spin-off group on cumulative impact assessment, which WGMPCZM wants to keep close contact with.
Linkages to other organisations	The WGMPCZM members have many linkages to relevant institutes, networks and organisations both from research and practice different group members are part of / have close contacts with through collaborations, research and consultancy (here just a few examples): - Research and analysis institutes: Helmholtz Zentrum Geesthacht, Marine Scotland, Marine Institute Galway, Nordregio, Swedish Institute for the Marine Environment, SYKE (Finland) - Research networks: the MSP Research Network, and the Marine Social Sciences Network. - Expert groups: the HELCOM VASAB MSP expert group, the EU MSP expert group, the IOC-UNESCO MSP initiative and expert group - National planning authorities from different ICES member countries (see nominated group members) and relevant working groups in the Nordic Council of Ministers.

Working Group on Bycatch of Protected Species (WGBYC)

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

2019/OT/HAPISG03 The **Working Group on Bycatch of Protected Species (WGBYC),** chaired by Kelly Macleod, UK and Sara Königson, Sweden, will meet in Den Helder, Netherlands on 10–13 March 2020 to:

a) Review and summarise annual national reports (Reg812/2004) or data submitted through the annual data call and other published documents to collate bycatch rates and estimates in EU waters and wider North Atlantic;

b) Collate and review information from national (Regulation 812/2004) reports and elsewhere in the North Atlantic relating to the implementation of bycatch mitigation measures and ongoing bycatch mitigation trials and compile recent results on protected species bycatch mitigation;

c) Evaluate the range of (minimum/maximum) impacts of bycatch on protected species populations where possible to assess likely conservation level threats and prioritize areas where additional monitoring/mitigation is needed;

d) Continue to develop, improve and coordinate with other ICES WGs on methods for bycatch monitoring, research and assessment.

e) Identify potential research projects and funding opportunities to further understand PETS bycatch and its mitigation

f) Continue, in cooperation with the ICES Data Centre, to develop, improve, populate through formal Data Call, and maintain the database on bycatch monitoring and relevant fishing effort in ICES and Mediterranean waters (Intersessional).

g) Address the special request from EU on emergency measures bycatch NE Atlantic by;

i) Evaluating pressures and threats due to commercial fisheries by-catches to harbor porpoises in the Baltic Sea and common dolphins in the Bay of Biscay.

ii) Evaluating whether the described conservation measures within the request are appropriate.

WGBYC will report by 27 March 2020 for the attention of ACOM.

Supporting information

Priority	The current activities of this Group will lead ICES into issues related to the ecosystem affects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very high priority.
Scientific justification	a–b) This is essential to use in answering part of the European Commission MoU request to "provide any new information regarding the impact of fisher-ies on marine mammals, seabirds..."; c) ICES Member Countries are required to reduce levels of bycatch under several pieces of legislation; the response to this ToR will help meet that aim; d) Bycatch monitoring and assessment is fundamental to the work of the group; in light of significant changes in legislation that will impact monitoring programs for PETS any improvements in coordination and methods will help the group and other workers in this field; e) Improving scientific understanding how target and non-target catches interact with commercial fishing gear is fundamental to developing effective mitigation measures to reduce bycatch on vulnerable species; f) An operating database allows for more efficient response to future advice requests and an audit trail for information used in the Group's reports; remaining intersessional ToR's all aim to increase effeciency of WGBYC's tasks in providing advice to various groups; g) The European Commission has decided not to amend Res. 812/2004 and to integrate monitoring of protected and endangered species into the new DCF (DC-MAP). It is essential to cooperate with the scientists who design observer schemes and protocols for the monitoring of catch and discards;
Resource requirements	None beyond usual Secretariat facilities
Participants	15–25
Secretariat facilities	Secretariat support with meeting organization and final editing of report
Financial	No financial implications.
Linkages to advisory committees	ACOM
Linkages to other committees or groups	JWGBIRD, WGFTFB, WGMME, WGSE, WGEF, WGCATCH, WGMIXFISH, WGSFD, WGNSSK, SCICOM

Linkages to other organizations	NAMMCO, ASCOBANS, ACCOBAMS, GFCM, EC, IWC

ICES/NAFO Joint Working Group on Deep-water Ecology (WGDEC)

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

2019/OT/HAPISG04 The **Joint ICES/NAFO Working Group on Deep-water Ecology (WGDEC)**, chaired by Laura Robson, UK, will meet by correspondence, 4–8 May 2020 to:

a) Collate new information on the distribution of vulnerable habitats as well as important benthic species and communities in the North Atlantic and adjacent waters, archive appropriately using the ICES VME Database, and disseminate via the Working Group report and ICES VME Data Portal;
b) Provide all available new information on the distribution of vulnerable habitats (VMEs) in the NEAFC Convention Area. This should also include information on the distribution of vulnerable habitats in subareas of the Regulatory Area that are closed to fishing for other purposes than VME protection, e.g. the haddock box at Rockall Bank. In addition, provide new information on location of habitats sensitive to particular fishing activities (i.e. vulnerable marine ecosystems, VMEs) within EU waters;
c) Develop standards for the provision of absence data and OSPAR habitat data to the ICES VME database, and utilise VME indicator data records to further develop and test kernel density estimation methods to assess VME likelihood;
d) Building on work initiated in 2019, work jointly with the WGMHM to test the use of habitat suitability models for mapping VME presence, to assess how such information could be incorporated when, for example, recommending proposals for VME closures.
e) Provide recommendations on additional VME indicators to be included in Annex III of the EU deep-sea access regulations, together with a full list of representative taxa for each of the new VME indicators and an indication of the classification under the VME Habitat type as per the table in Annex III.

WGDEC will report on TOR a, b and e by 22 May 2020 and all TORs by 15 June 2020 to the attention of the ACOM Committee

Supporting Information

Priority	The current activities of this Group will enable ICES to respond to advice requests from a number of clients (NEAFC/EC). Consequently, these activities are considered to have a high priority.
Scientific justification	ToR [a] The Joint ICES/NAFO Working Group on Deep-water Ecology undertake a range of Terms of Reference each year; the scope of these cover the entire North Atlantic, and include aspects such as ocean basin processes. Therefore, collating information on vulnerable habitats (including important benthic species and communities) across this wide geographic area (and adjacent waters) is essential. To this end, a VME data call will be run from January to March 2020, facilitated by the ICES Data Centre. Data will be quality checked/prepared one month in advance of WGDEC 2020. New data will be incorporated into the ICES VME database and data portal. This ToR includes any development work on the ICES VME database and data portal, as identified by WGDEC, with support from the ICES Data Centre. ToR [b] Collation of information and associated maps (using TOR a) are required to meet the

	annual NEAFC and EU requests. ICES provides advice, via its working groups and its advisory committee (ACOM), "to continue to provide all available new information on the distribution of vulnerable habitats in the NEAFC Convention Area", which includes "information on the distribution of vulnerable habitats in subareas of the Regulatory Area that are closed to fishing for other purposes than VME protection, e.g. the haddock box at Rockall Bank". This information is also used in combination with NEAFC VMS data (analysed by WGSFD) to advise on "fisheries activities in and in the vicinity of such habitats". This ICES advice supports the objective of NEAFC recommendation 19:2014 to "ensure the implementation by NEAFC of effective measures to prevent significant adverse impacts of bottom fishing activities on vulnerable marine ecosystems known to occur or likely to occur in the NEAFC Regulatory Area based on the best available scientific information provided or endorsed by the ICES". Furthermore, ICES provides advice, via its working groups and its advisory committee (ACOM), to support the European Commission request to provide "new information on the impact of fisheries on sensitive habitats. This should include new information on the location of habitats sensitive to particular fishing activities". The location of newly discovered/mapped sensitive habitats (i.e. vulnerable marine ecosystems, VMEs) is critical to these NEAFC and EU requests. ToR [c] The VME weighting algorithm was developed in 2015/2016 to utilise data in the ICES VME database from a range of survey types, to determine likelihood of VME presence and associated confidence. In 2019, new methods of determining VME likelihood were explored via kernel density estimation (KDE). This ToR will further this work and look to address limitations in the use of KDE on datasets from the VME database, to optimise its use for assessing VME likelihood. The inclusion of absence data, and additional presence records from the OSPAR database, to the VME database would further enhance any assessment of VME likelihood, therefore this ToR will also identify standards to include these data types. ToR [d] The potential use of Species Distribution Modelling (SDM) and Habitat Suitability Modelling (HSM) as a tool to identify areas where VME are likely to occur has arisen several times over the last ten years in WGDEC. However it has not yet been used to provide recommendations to ACOM on how to incorporate such information when suggesting VME closures through draft ICES advice. This ToR will utilise the considerations for model creation and criteria for model use developed at WGDEC 2019, to test the use of HSM for assessing VME likelihood, and document the methods, decisions taken, and issues encountered. ToR [e] For the ongoing request work for the EU with regard to the deep sea access regulation (ref. (EU)2016/2336), ICES have been asked to provide scientific input on the list of VME indicators to be included in Annex III of the EU deep-sea access regulations. This input should include a full list of representative taxa for each of the new VME indicators and an indication of the classification under the VME Habitat type as per the table in Annex III.
Resource requirements	Some support will be required from the ICES Secretariat.
Participants	The Group is normally attended by some 15–20 members and guests.
Secretariat facilities	None, apart from WebEx and SharePoint site provision.
Financial	No financial implications.
Linkages to advisory committees	ACOM is the parent committee and specific ToRs from WGDEC provide information for the Advice Committee to respond to specific requests from clients.

Linkages to other committees or groups	While there are currently no direct linkages to other groups, WGDEC should develop stronger links (ideally through the establishment of joint Terms of Reference) with WGSFD, WGMHM, WGDEEP and WGFBIT.
Linkages to other organizations	As a Joint ICES/NAFO group, the work of this group links to work being undertaken by Working Groups under the NAFO Scientific Council; specifically, WGESA.

Working Group on the Ecosystem Effects of Fishing Activities (WGECO)

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

2019/OT/HAPISG05 The **Working Group on the Ecosystem Effects of Fishing Activities (WGECO),** chaired by Tobias van Kooten, NL and Brian Smith, USA, will meet by correspondence, 31 March–7 April 2020 to:

a) Investigate the ecological consequences of stock rebuilding, with particular emphasis on benthivorous fish and invertebrates.
   1) Make first-order estimates of predation pressure on benthos;
   2) Examine evidence of food limitation and density-dependent growth;
   3) Compare the footprints of trawling to the footprints of predation pressure on benthos.

b) Apply spatial distribution indicators to survey data (fish and benthos) across marine ecosystems. Analyse temporal trends in spatial indicators in relation to potential drivers and pressures (e.g. climate change, abundance changes).

c) Conduct a "reality check" and horizon scanning survey within WGECO. The aim is to develop a consensus view of the major emerging issues in relation to fisheries and ecosystems, and on which WGECO could focus future work. WGECO members will provide a list of emerging issues (horizon scanning), that would benefit from scrutiny by WGECO. This list will be collated and used as material for a plenary discussion, and with the aim of producing a perspectives paper in the ICES JMS or Fish and Fisheries.

d) Prioritize indicators (one or more than one) from a set of indicators from current and earlier work by WGECO or its participants (including particularly those from ToR d of WGECO 2018), which can be estimated on a routine basis and are applicable across several ecoregions. For each prioritised indicator, supply a short explanatory text for justification of the prioritization, identify the required steps to operationalize their use in the ICES fisheries and/or ecosystem overviews, and outline how WGECO or ICES can support their implementation over the next three years.

e) WGECO to review a working document describing a workflow to be used by WKEUVME to propose a set of regulatory area options ensuring VME (vulnerable marine ecosystems) protection and fishing in line with EU's deep-sea access regulation. Suggest alternative options (if relevant) and/or improvements to the proposed workflow supported by relevant scientific literature. The review should also provide scientific input on the associated trade-offs between the different regulatory area options, with respect to how area closures will ensure VME protection and how the closures will affect fisheries (e.g. spatial footprint and intensity of bottom fishing). The review should be done in the context of the established ICES VME and VMS (vessel monitoring system) / logbook data (respective data calls) that serve as the required input to operationalize the workflow and any subsequent updates.

WGECO will report by 30 April for the attention of ACOM.

Supporting Information

Priority	The current activities of this Group will enable ICES to respond to advice requests from member countries. Consequently these activities are considered to have a very high priority. It will also lead ICES into issues related to the ecosystem affects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very high priority.
Scientific justification	Term of Reference a) Many stocks are rebuilding and will likely have higher abundance and biomass than we have seen in recent times. This in turn will likely have effects through trophic interactions both up and down the foodweb. At ICES, WGECO and WGSAM have been tasked previously with similar ToRs. WGECO will investigate the potential consequences of stock recovery of benthivorous fish and invertebrates, their ensuing risks for fish stock management and the use of MSFD indicators. It is hypothesized that a large increase in benthivorous fish will have an impact on benthic productivity and biodiversity. This ToR requires data on the spatial distribution of benthivorous predators, their prey consumption rates and diet composition. It also requires data on the abundance and production of benthic faunal. This ToR links to ToR c. Term of Reference b) WGECO has traditionally had a leading role in developing and testing indicators, and their use for provision of advice. The work of this ToR facilitates operationalization of these indicators, by identifying data sources, refining, evaluating their strengths and weaknesses and gaps in indicator availability. Indicators that are evaluated to be promising will be applied to fish and benthic invertebrates species in the ICES region. Term of Reference c) The ICES Strategic Plan seeks to incorporate a wider range of scientific knowledge into advice to inform decision-makers and society about the state of our seas and oceans, the consequences of human use, and option for conservatoin and mangement. This ToR will allow WGECO to contribute strongly to the development of future ICES strategy. We intend to seek input across the national and disciplinary range of WGECO members, many of whom are operating at a high level in the field and in the home institutes. We aim to publish the results of this initiative as a perspective paper in one of the key journals, and this will be available to inform future progress for this important and centrally positioned Expert Group. Term of Reference d) WGECO has over consecutive years (e.g. 2016, 2017 and 2018) proposed and reviewed indicators. For ICES producing a set of quantative indicators linked to exsiting data, that can be estimated on a routine basis and are applicable across several ecoregions is of high priority. Given the overaching role of the group, WGECO is in a good position to provide steer in term of a priority set of indicators using criteria (see e.g. Rice and Rochet 2005 or WGBIODIV 2015 on OSPAR indicators). This TOR also offers WGECO or ICES the opportunity to work in a structured fashion over a 3 year period towards operationalizing a set of prioritized indicators for use in ICES advice products, namely for the ICES fisheries and/or ecosystem overviews. Term of Reference e) During their previous meeting at ICES HQ (8–16 April 2019) WGECO provided initial input on an EU DGMARE request to ICES relating to the EU's Deep Sea Access Regulations. The suggested ACOM approved process (phase 1 and phase 2) is designed to ensure ICES's scientific integrity while at the same time ensuring required dialogue with the managers so that what ICES can offer (in terms of data, VMEs and VMS) can contribute towards the deep sea access regulation for regulatory purposes. WGECO offered to provide further scientific input during their 2020 meeting as a review of the workflow and the set of criteria to propose a set of regulatory area options to managers. More specifically to provide scientific input on the associated trade-offs between different areas selected (an integral part of Phase 2). As such, WGECO is tasked to review a working document describing a workflow to be used by WKEUVME to come up with a set of regulatory area options using available ICES data. Specifically, WGECO is tasked to: • review the working document to provide input on whether the suggested workflow to

	identify regulatory areas options is suited for management purposes, and, in line with previous ICES work related to the deep-sea access regulation; • suggest alternative options (if relevant) and/or improvements to the proposed workflow supported by relevant scientific literature • provide scientific input on how to best estimate for each of the regulatory area options, how area closures will ensure VME protection and how the closures will affect fisheries (e.g. spatial footprint and intensity of bottom fishing). • consider how the workflow can accommodate future updates of the assessment based on ICES VME and VMS data and data calls; • consider whether the workflow can best conform to the ICES FAIR principles that data is fully documented
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 20–25 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory committees	There are no current direct linkages with the advisory committees.
Linkages to other committees or groups	There is a very close working relationship with the groups of the Fisheries Technology Committee, JWGBIRD, BEWG, WGBIODIV, WGBYC, WGFBIT and WGSAM.
Linkages to other organizations	OSPAR, HELCOM

Working Group on Offshore Wind Development and Fisheries (WGOWDF)

2019/FT/HAPISG06 A **Working Group on Offshore Wind Development and Fisheries** (WGOWDF), co-chaired by Andy Lipsky*, USA; Andrew Gill*, UK; and Antje Gimpel*, Germany, will be established and 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	27–29 April	by corresp/ webex		physical meeting cancelled - remote work
Year 2021		Europe (tbc)		
Year 2022			Final report by DATE to SCICOM	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Review and report on fishing industry interactions with offshore wind development and	Europe has been operating offshore wind energy facilities for 20 years. North America is on the verge of large-	2.2, 2.3, 2.7	2 years	Review paper

	document lessons learned including effects on the distribution of fishing operations	scale development. The European experience can be used to document the effects of offshore development on fishery operations, fishing communities, and fishery economics. While there are distinct differences in the scale and scope of fisheries between the North American and European wind development areas; there is also the opportunity to identify common issues and promote research to address these issues.			
b	Develop and report on methodologies to assess the impact of offshore wind development on fishery resources. These assessments should include observational and model-based approaches and consider hindcast and forecast data and models.	Offshore wind energy development necessitates changes in fishery-independent survey operations and potentially fishery-dependent data collection. Wind energy development also transforms habitats, thus affecting the distribution and abundance of fish and shellfish populations. Both statistical survey design and survey techniques need to be adapted and/or developed. In addition, modeling approaches need to be developed to understand the impacts of wind development and forecast possible future conditions.	2.2, 2.3, 2.7	3 years	Method development papers
c	Consider and report on effects of habitat alteration by offshore wind development on fisheries. This consideration should include anticipated changes to the benthic habitats, potential for invasive species, vertical and horizontal	Construction, operation, and decommissioning of offshore wind energy developments will affect marine habitats. These activities include seafloor and water column disturbance, ocean noise, electromagnetic signals, and habitat	2.2, 2.3, 2.7	3 years	Review paper Recommendations of additional studies linked to other WGs

	movement of water, sediment suspension, and water column changes.	transformation. The various activities will be documented and methodologies for study identified. Potential effects will also be documented on the range of marine organisms with particular emphasis to species that are the target of commercial and / or recreational fisheries.			
d	Review ICES expertise and identify gaps and opportunities relative to renewable energy and marine ecosystems and sustainability	The goal of WGOWDEF is to complement the activities of WGMBRED and WGMRE with a focus on fisheries interactions. The development and activities of the WG will be coordinated with these other two WG. The WG will also evaluate other ICES actvities and coordinate with relevant groups.	6.6	Year 3	Report to ICES

Summary of the Work Plan

Year 1	The WG will meet and exchange ideas on ToR a, b, c. The WG will then develop a plan as to how to address ToR a, b, c in the 3 year time frame. The initial review paper will be planned and worked on during Year 1, both at the inaugral workshop and intersessionally. The WG Chairs will interact with the Chairs of WGMBRED and WGMRE to ensure activities are complementary.
Year 2	The WG will make progress on the all review papers and will plan workshops related to each of ToR a, b, and c. The first workshop will present the draft review for ToR a and work up the final paper. The ToR b and c workshops will be structured to gather the information needed for both the other papers, namely the methodologies and the effects. The WG Chairs will interact with the Chairs of WGMBRED and WGMRE to ensure activities are complementary.
Year 3	The WG will complete the ToR b and c review papers and submit for publication. The WG will also discuss next steps for the WG. The WG will complete review of ICES expertise related to renewable energy and marine ecosystems and sustainability working with WGMBRED and WGMRE. A report will be produced for ICES.

Supporting information

Priority	Offshore wind energy development continues in Europe and is beginning in earnest in North America. Sustainable fisheries are critical to global food security and renewable energy is critical to energy security and climate change mitigation. Coexistence requires an understanding of the interactions between offshore wind energy development and fishing. This understanding can be used to foster the exchange of information, collaboration in addressing science questions, and support decision-making. Consequently, these activities are considered to have a very high priority across the ICES area especially as wind energy development continues.
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group will be attended by some 30–40 members and guests..
Secretariat facilities	WebEx support for remote participating
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no obvious direct linkages but developing the expertise could link to ACOM in the future.
Linkages to other committees or groups	There is potential for a very close working relationship WGMBRED and WGMRE as well as communication with WKUSER. Also the WGSFD (Spatial Fisheries Data)
Linkages to other organizations	There are linkages to fishing organizations and wind developers in the USA and similar linkages in Europe, including wider links to licencing/permitting authorities and other relevant stakeholders.

Workshop on Global Ocean Social Sciences (WKGLOSS)

2019/WK/HAPISG07 A **Workshop on Global Ocean Social Sciences** (WKGLOSS), chaired by Denis Bailly*, France, Olivier Thébaud*, France, and Jörn Schmidt*, Germany, will be organized in collaboration with the Ocean University Initiative in Brest, France, 5-6 November 2019 to:

a) Identify central issues and conditions for the involvement of the social sciences in the UN initiative on the Decade of Ocean Sciences for Sustainable Development (2021-2030); (Science Plan codes: 7.2, 7.4, 7.6).

The workshop will be structured in 6 brainstorming sessions organized in cabaret style with a capacity to host up to 120 participants (about 20 tables with 6 participants each changing between sessions). Each group will be invited to discuss a series of thematic, disciplinary and methodological questions with the aim of co-creating a ground-breaking report that will be submitted to the Executive Planning Group of IOC, to be held in January 2020. This contribution will also feed the discussion at the Global Planning Meeting planned in June 2020 to gather the views of stakeholders before the adoption of the implementation plan for the decade by the United Nations General Assembly's in November 2020.

The event will take place at "Le Quartz" congress hall in Brest (France) on 5 and 6 November. A registration fee has been set to 100 € to cover the cost of lunches and

organization, and an extra 30€ for participants who wish to join the social dinner. PhD students and post-doctoral students are invited to apply to act as group discussion rapporteurs; registration fees will be waived for selected candidates. See registration web page for more information: http://ocean-univ.org/gloss/

WKGLOSS will report by 1 December 2019 for the attention of SCICOM and SIHD.
This report will include the recommendation document produced by the Ocean University Initiative.

Supporting information

Priority	This joint workshop with the Ocean University Initiative (University of Brest, France) will enable researchers from the ICES community to contribute to the identification of key research areas and strategies for the integration of social sciences in the planning o the UN ocean science decade for sustainable development. The outcomes of the workshop will also contribute to inform current initiatives of ICES in this domain, in line with its Strategic Plan.
Scientific justification	The United Nations General Assembly has declared the decade 2021-2030 as the "Decade of Ocean Sciences for Sustainable Development". The Intergovernmental Oceanographic Commission of UNESCO is in charge of submitting a programme for this decade. To this purpose, a series of international events, workshops and symposia are organized to contribute to the work of IOC. IOC is assisted in this task by a group c 19 international experts, the Executive Planning Group. Term of Reference a): In this context, the Ocean University Initiative (University of Brest, France) and ICES will organize an international workshop gathering researchers in the human and social sciences, in all their diversity, with the aim to identify central issues and conditions for the involvement of the social sciences in the UN initiative. The event, under the name GLOSS (GLobal Ocean Social Sciences), has been labelled an "Ocean Decade Event" by the IOC.
Resource requirements	The Ocean University Initiative will provide the main input to this event and resources are already committed. Additional resource will come from registration fees.
Participants	A participation of 100 to 120 is expected.
Secretariat facilities	None required
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 are very strong links between the objective of this initiative and the work programmes of the Strategic Intitative on Human Dimensions, as well as of the recently established working groups WGSOCIAL and WGECON. Members of longer established ICES working groups with strong involvement of social scientists, such as WGMARS or WGHIST may also be interested in contributing to the workshop.
Linkages to other organizations	The workshop is closely aligned with similar work conducted by UNESCO-IOC

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	by corresp/ webex	E-evaluation to DIG and HAPISG	
Year 2021	1) TBD - Q1 2) TBD - Q2 3) TBD - Q3 4) TBD - Q4	Dates and venue as DIG	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 VMS and Logbook DB, responsibilities, processes and resources.	In order to successfully develop and maintain a workplan for the VMS and Logbook DB it is necessary to first establish a vision for the future of the VMS and Logbook DB, supported by guidelines on project management, handling of feedback, task prioritisation and expected resource availability.	3,2, 3,5, 4,2	3 years/ Generic ToR	The WGSpatialFisheriesDataGov manifesto: a mission statement on the direction of VMS and Logbook DB development and overarching short to medium term 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 Logbook DB. Feedback will be compiled by WGSpatialFisheriesDataGov and	The VMS DB should develop to meet the requirements of a broad range of users and thus needs to be responsive to user feedback. Feedback will be collected and organised using GitHub and the	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 and prioritised list of VMS DB related EG recommendations along with suggested resource allocations, budget estimates and feasibility estimates.

	appropriate actions to be taken with assigned responsibilities and resource requirements will be listed and prioritised.	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.			
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.

Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem (WGEXT)

2019/FT/HAPISG09Working Group on the Effects of Extraction of Marine Sediments on the Ecosystem (WGEXT), chaired by Keith Cooper*, UK, 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	27–30 April	by corresp/ webex		physical meeting cancelled - remote work
Year 2021		France (tbc)		
Year 2022			Final report by DATE (tbc) to SCICOM	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
A1	Review data on marine extraction activities and provide a summary on marine extraction for the OSPAR region to OSPAR	a) OSPAR requirements b) Advisory requirements	2.1, 6.4	Year 1, 2, 3	Annual extracted amounts and areas as a chapter in all Interim and Final Reports
A2	Review of developments in marine sediment resource mapping, legal regime and policy, environmental impact assessment, research and monitoring	a) Advisory requirements b) Inform other counties (ICES, EU) to optimize their policy and management	2.1, 6.4	Year 3	Chapter in Final Report
B	Finalize an ICES aggregate database comprising data on marine extraction activities	a) Advisory requirements b) Cooperation with ICES Data Centre	2.1, 6.4	Year 1,2,3	Year 1: finalize template Year 2: incorporate historical data in ICES database Year 3: streamline the dataflow from ICES countries to database
C	Update ICES Guideline for Management of Marine Sediment Extraction	a) Advisory requirements b) Inform other countries (ICES, EU) to optimize their policy and management	2.1, 6.4	Year 1,2,3	Year 1: review the Guidelines Year 2: formulate revised guidelines Year 3: revised guidelines accepted by OSPAR
D	Ensure outputs of the WGEXT are accessible by publishing as a group	a) Inform other countries (ICES, EU) to optimize their policy and management b) Contribute to the visibility and impact of ICES	2.1, 6.4	ongoing	Publish results of the WG on intensity of extraction, on MSFD and on cumulative impacts as journal papers. Distribute Annual Reports to networks outside ICES
E	Include marine sediment extraction in cumulative impact assessment	Contribute and working together with other ICES and OSPAR WGs that are involved in this subject.	2.1, 2.2	Year 1,3	Year 1: intensify the contacts with other WGs in OSPAR and ICES. Year 3: define in cooperation with other WGs a Best Practise to include marine extraction in cumulative inpact assesments.

F	Review developments with implications for the management and the effects of marine sediment extraction.	a) Advisory requirements b) Contribute to the update of the ICES guidelines	2.7, 6.4	Year 3	Chapter in Final Report

Summary of the Work Plan

Year 1	The data on marine extraction are published each year and send to OSPAR (ToR A1). To put the data in the ICES data base a template will be finalized (ToR B). The inventory for revised ICES Guidelines is ready (ToR C). A theme session on extraction will be held at ASC 2020 and the essay on dredging intensity will be submitted to a journal (ToR D). Contacts with other ICES and OSPAR WGs on cumulative effects will be established (ToR E).
Year 2	The data on marine extraction are published each year and send to OSPAR (ToR A1). The historical data (1986-2018) will be put in the ICES data base (ToR B). The text for the actualization of the ICES Guidelines will be ready (ToR C). The review on Extraction and MSFD and the review on Cumulation of Effects will be submitted to a journal (ToR D)
Year 3	The data on marine extraction are published each year and send to OSPAR (ToR A1). A review of developments in marine sediment extraction in the ICES countries will be published in the Final Report (ToR A2). The gathering of extraction data will find its way to the ICES data base (ToR B). The revised ICES Guidelines will be accepted by ICES and OSPAR (ToR C and F). An overview of ToR A1 and A2 will be submitted to a journal (ToR D and F). Together with other ICES an OSPAR WGs a Best Practise to include marine extraction in cumulative impacts assessments will be formulated (ToR E).

Supporting information

Priority	The activities of WGEXT will lead into issues related to the effects on the ecosystem of marine sediment extraction. Sediment extraction is increasing in some countries and rather stable in others. This human activity is connected to several descriptors in the EU MSFD. The report of WGEXT and the ICES Guidelines are used in the management of extraction in the member countries. Consequently, the activities of WGEXT are considered to have a high priority.
Resource requirements	The activities of WGEXT are focussed on the use of existing research programmes (e.g. EIA monitoring) and data on marine extraction and management. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Annual Meeting of WGEXT is normally attended by some 12-20 members and guests. Besides that several members contribute by correspondence.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	ACOM
Linkages to other committees or groups	There is a direct linkage to the ICES Data Centre and a potential working relationship with WGs in SCICOM and OSPAR who are involved in cumulative effects and spatial planning.
Linkages to other organizations	Data on marine extraction are delivered to OSPAR.

Stock Identification Methods Working Group (SIMWG)

2019/FT/HAPISG10 The **Stock Identification Methods Working Group** (SIMWG), chaired by Christoph Stransky*, Germany, 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	By correspondence			Change in Chair: **Outgoing**: Lisa Kerr, USA **Incoming**: Christoph Stransky, Germany
Year 2021	tbc	tbc		
Year 2022	By correspondence		Final report by 1 August to SCICOM	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Review recent advances in stock identification methods	a) Tracks best practices in stock ID b) Promotes new technologies Relevant to all ICES species	1.4, 5.1, 5.2	3 years (and continued)	EG report
b	Provide technical reviews and expert opinions on matters of stock identification, as requested by specific Working Groups and SCICOM	a) Contributes to understanding of structure and connectivity of fish populations/stocks b) Highly relevant to assessment and management	1.4, 5.1, 5.2	3 years (and continued)	EG report and updated table of species reviews
c	Review and report on advances in mixed stock analysis, and assess their potential role in improving precision of stock assessment	Relevant to resolving mixed stock composition issues in assessment and management.	1.4, 5.2, 5.4	3 years	EG report and contribution to ICES ASC; methodological paper in international journal

Summary of the Work Plan

Year 1	Address terms of reference through work by correspondence in 2020

Year 2	Organise a physical meeting for SIMWG for summer 2021.
Year 3	Address terms of reference through work by correspondence in 2022

Supporting information

Priority	Understanding stock structure is a fundamental requirement before any assessment or modelling on a stock level can be contemplated. SIMWG liaises with ICES expert groups and working groups on stock identification issues and continues to review new methods as they develop
Resource requirements	SharePoint website and clear feedback from expert groups.
Participants	The Group is normally attended by some 10–15 members and guests.
Secretariat facilities	Standard support
Financial	None
Linkages to ACOM and groups under ACOM	ACOM
Linkages to other committees or groups	SIMWG has recently worked closely with a range of ICES working groups including WGWIDE, WGBIE, WGHANSA, and NWWG; benchmark workshops including WKPLE and WKHAD, and advice drafting groups such as ADGDEEP, and in previous years SIWMG connected with many more ICES groups to fulfill requests.
Linkages to other organizations	There are no obvious direct linkages, beyond the SIMWG members' affiliation and commitment to their own employers.

Workshop on Fish of Conservation and Bycatch Relevance (WKCOFIBYC)

2019/WK/HAPISG11 Workshop on Fish of Conservation and Bycatch Relevance (WKCOFIBYC), chaired by Maurice Clarke*, Ireland will meet by Correspondence (Webex) on 16–20 November 2020 to:

a) Compile a list of fish species (including non-commercial and commercial) of conservation concern (threatened, sensitive, or already listed in legislation) that should be included in future assessments by ICES, and compile the assessment units for these species, including considering the regional approach for ecosystem/fisheries assessments/advice of ICES ecoregions. This list will be internally reviewed in ICES (e.g. by WGECO) and then passed to ACOM for consideration (Science Plan codes: 3.2, 3.5);

b) Compile a list of fish species of relevance for ICES bycatch advice and assessment units for these species, including considering the regional approach for ecosystem/fisheries assessments/advice of ICES ecoregions. This list will be internally reviewed in ICES (e.g. by WGECO) and then passed to ACOM for consideration (Science Plan codes: 3.2., 3.5).

WKCOFIBYC will report by 15 December 2020 for the attention of ACOM and SCICOM.

Supporting Information

Priority	High.
Scientific justification	This workshop will start bringing together two approaches running as yet in-parallel: fishes (including elasmobranchs) of conservation concern and bycatch relevance. It is very likely that follow-up workshops might be required,

	dependent on the success and outcome of this WK. **Term of Reference a):** This is a comprehensive list of fish species which are included in existing legislative or soft-legal frameworks that convey conservation interest upon particular species. This includes EU MSFD (D1C1-C5), EU Habitats Directive, EU Fish Redlist, CFP Prohibited Fish List, and various national designations or lists. To ensure ICES is prepared for changes in the list of species of concern, the WK will also identify fish species that, in the view of the WK should or could be included in future assessments. This should include the considerations by WGECO. The selection of assessment units will be informed by available information and data flows and be consistent with current assessment requirements. **Term of Reference b):** This is a comprehensive list of fish and elasmobranch species which will be considered in ICES bycatch advice, with the ultimate aim to deliver recurrent advice in Fisheries Overviews (i.e. advice structured by ecoregions) from 2022 onwards.
Resource requirements	None
Participants	It is envisaged that 12–15 people might attend.
Secretariat facilities	Secretariat support for remote meeting.
Financial	No financial implications, however, the work area may create advice custom for ICES.
Linkages to advisory committees	ACOM, HAPISG.
Linkages to other committees or groups	There is a linkage with WKLIFE in terms of assessment methodologies. Other groups with relevance include: WGBYC, WGEF, WGDEEP, WGECO.
Linkages to other organisations	OSPAR, HELCOM, ICCAT-Bycatch Group (potentially EIFAC if anadromous species are to be considered)

Workshop on fisheries Emergency Measures to minimize BYCatch of short-beaked common dolphins in the Bay of Biscay and harbor porpoise in the Baltic Sea (WKEMBYC)

2019/WK/HAPISG12 The **Workshop on fisheries Emergency Measures to minimize BYCatch of short-beaked common dolphins in the Bay of Biscay and harbor porpoise in the Baltic Sea (WKEMBYC)**, chaired by Vincent Ridoux*, France, will be established and will meet by correspondence (WebEx) on 1-3 April 2020 to:

a) Produce and analyse maps of fishing effort in the relevant areas of the Bay of Biscay and Baltic Sea using the VMS and logbook information collected through the ICES data call.

b) Based on available information provided to ICES by the European Commission and work by WGBYC 2020 and WGMME 2020, WKEMBYC will:

1. assess, and if applicable, propose alternative appropriate emergency measures that could be used to ensure a satisfactory conservation status of these populations; (Science Plan codes: 6.1);
2. suggest emergency measures that are necessary to ensure a satisfactory conservation status of these populations. (Science Plan codes: 6.1);

WKEMBYC will report by 21 April 2020 for the attention of the ACOM and SCICOM.

Supporting information

Priority	This workshop was set up to produce the scientific basis to answer a special request from DGMARE. Consequently, the workshop is considered to have a high priority.
Scientific justification	The work described under ToR a) and ToR b) is needed to evaluate whether the fisheries emergency measures for the North East Atlantic short beaked common dolphin in the Bay of Biscay and the Baltic Sea harbour porpoise, described in the information provided to ICES by the European Commission, are necessary and appropriate, in the context of EU law, in particular Articles 2 and 12 of Regulation (EU) 1380/2013; Article 3(2) of Regulation (EU) 1241/2019 and Article 1(i) of Council Directive 92/43/EEC. Also, the Workshop will contribute to evaluate alternative measure that could be used to ensure a satisfactory conservation status of these stocks, in the context of EU law as above.
Resource requirements	None, apart from meeting facilities and Secretariat support.
Participants	The workshop will be attended by 10-15 persons.
Secretariat facilities	None.
Financial	Additional resource requirements will be met by funded advisory requests from clients.
Linkages to advisory committees	ACOM
Linkages to other committees or groups	WGMME, WGBYC, HAPISG, EPDSG
Linkages to other organizations	

Methods Working Group (MGWG)

To be submitted November 2019

Working Group on Marine Renewable Energy (WGMRE)

To be submitted November 2019

Resolutions approved in 2018

Working Group on Marine Benthal and Renewable Energy Developments (WGMBRED)

2018/MA2/HAPISG01 The **Working Group on Marine Benthos and Renewable Energy Developments** (WGMBRED), chaired by Jan Vanaverbeke, Belgium, and Joop Coolen, the Netherlands, 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	12–15 February	Brussels, Belgium		
Year 2020	20–23 April	by corresp/ webex		physical meeting cancelled - remote work
Year 2021			Final report by DATE	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Develop guidelines on standardised data collection methodologies and criteria for metadata to enable integration of benthos data of marine renewable energy devices into wider international frameworks.	WGMBRED recognises the fact that data on the benthos of marine renewable energy devices are collected and stored according to different standards, hampering in integrated analyses of the effect of such devices on the benthos on wider spatio-temporal scales. Standardisation of data collection and storage methodology will overcome this problem, facilitating joint analyses and international collaboration.	3.1	Year 1–3	Synthesis report to ICES on review of existing standards and methodologies including guidelines for setting criteria of metadata facilitating integration and analysis of marine renewable energy devices benthic data.
b	Provide an integrated example dataset based on benthos data of marine renewable energy devices from various sources	To date, data on the effect of marine renewable energy devices are scattered in national or institutional databases. This lack of integration hampers the understanding of the general effects in space and time of renewable energy devices on the marine benthos. WGMBRED will therefore provide a prototype of an integrated database (based on publicly available data) that can be used for scientific purposes by the international scientific community	2.1; 3.1	Year 1–3	Prototype database on the benthos of renewable energy devices, submitted to a database repository.
c	Review the knowledge on changes in the benthos associated with environments	Earlier WGMBRED work, showed a locally increased habitat diversity in areas where renewable energy arrays	2.1; 2.2; 6.1	Year 1–3	Report to ICES on the assessment of the evidence of

	where marine renewable energy devices are located and relate them to the presence of these structures and the changes to other human activities (e.g. fisheries)	are in function. This results in increased diversity of the benthos (including non-indigenous species). At the same time, many fisheries activities are excluded from these areas. As such, marine renewable energy device arrays could act as de facto conservation areas for benthos, adding to the existing network of designated Marine Protected Areas. This is of high importance and should be taken into account during marine spatial planning processes where multiple activities within concession zones for marine renewable energy devices are being planned for.			whether marine renewable energy device arrays can be considered as de facto marine protected areas.
d	Develop the scientific basis for assessing the conservation of benthic habitats beyond the exploitation phase of marine renewable energy installations	Based in the current knowledge, WGMBRED realises that the local and regional biodiversity of the benthos may be positively affected in areas where marine renewable energy devices are exploited. This results from a combination of the provisioning of habitat, food and shelter for a number of marine organisms. These effects need to be taken into consideration in the decision making process for locating and the possible decommissioning of marine renewable energy devices sites.	6.1	Year 1–3	Manuscript to be submitted to peer-reviewed journal
e	Review and provide an empirical overview on the role of benthos associated with marine renewable energy devices in the maintenance of important ecosystem processes.	WGMBRED aims to provide the knowledge base to support the implementation of the Ecosystem Approach to Management with respect to marine renewable energy devices. This requires moving towards a process-driven understanding of how the changes to the structural and functional composition of the benthos (including non-indigenous species) associated with marine renewable energy devices) contributes to ecosystem functioning and the provisioning of ecosystem services (such as nutrient cycling and food provision via fisheries species).	2.2	Year 1–3	Manuscript submitted to a peer-reviewed scientific journal
f	In collaboration with WGMRE, provide a preliminary draft of advice on the current state and knowledge of studies into the deployment and environmental impacts of the following wet renewable energies and marine energy storage systems: wave energy	Advisory Requirements: ICES has received a special request from OSPAR to advice on the current state and knowledge of studies into the deployment and environmental impacts of wet renewable technologies and marine energy storage systems. Given its expertise, WGMBRED wil contribute to the advice with data and expertise on the benthic component of	6.1	Year 1	Section of the report ready for WGMRE on 25 February 2019.

	(floating, coastal infrastructure), tidal stream (screws, kites), tidal flow (barrage, lagoon) and others. Advice should cover the status of wet renewable development in the OSPAR region, future prospects, potential environmental problems (seabed habitat loss/disturbance, fish, marine mammals, birds, seascape/ public perception, and cumulative impacts), potential benefits, next steps and conclusions.	the marine realm. A subgroup will meet in ICES headquartes 15-16 January with experts from WGMRE and WGMBRED to draft a first version of the advice. The preliminary draft advice will be developed further during WGMBRED meeting and finalised during WGMRE meeting.

Summary of the Work Plan

Year 1	Begin reviews to start to address ToRs a, c, d and e; make inventory of data availability for compilation and integration for ToR b; develop and set out opinion matrix for ToR c. Contribute to advisory request from OSPAR (ToR f).
Year 2	Continue review activity to address ToRs a, c, d and e; Develop structure and populate integrated database for ToR b, further develop opinion matrix ToR c
Year 3	Finalise reviews ready for submission for ToRs a, c, d and e; make integrated database publicly available (ToR b), finalise expert opinion table ToR c;

Supporting information

Priority	The activities of the EG will lead ICES into a structural and functional understanding of how the marine benthal community of marine renewable energy devices contributes to the functioning of the marine ecosystem, and how they can act as areas where benthal biodiversity can be promoted. The objectives addressed for this group are therefore considered of high relevance in the context of ecosystem-based management of coastal areas where an increasing number or marine renewable energy devices are planned, and will be of directly use in marine spatial planning initiatives. Hence, the activities can be considered to be of very high priority.
Resource requirements	No specific resource requirements beyond the need for invited members to prepare for and resource their participation in the meeting. Additional resources are required to respond the request for advice from OSPAR. A subgroup of experts from WGMRE and WGMBRED will meet in January in Copenhagen to draft a first response to the adivice.
Participants	The Group is normally attended by 15–20 members and guests working with the effects of marine renewable energy developments on the marine benthal communities (i.e. algae, invertebrates, and demersal fish). Participation from current ICES member countries and also from countries where marine renewable energy developments have started recently (Spain, Portugal) to develop knowledge on these activities.
Secretariat facilities	None.
Financial	Additional resources covered by OSPAR special request.
Linkages to ACOM and groups under	There are no obvious direct linkages. However, some contributions could be made to under 'pressures' as part of ICES ecosystems overviews.

ACOM	
Linkages to other committees or groups	There is a very close working relationship with Benthos Ecology Working Group (BEWG), the Working Group on Marine Renewable Energy (WGMRE), the Working Group for Marine Planning and Coastal Zone Management (WGMPCZM) and the Working Group on Biodiversity Science (WGBIODIV).
Linkages to other organizations	OSPAR ICG-CUM

ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors (WGBOSV)

2018/MA2/HAPISG02 The **ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors** (WGBOSV), chaired by Lisa Drake, 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 2019	6-8 March	Weymouth, UK		
Year 2020	2–4 March	Gdynia, Poland		
Year 2021	DATE March	TBD	Final report by DATE	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Conduct strategic planning (identify and develop collaborative activities, advance and standardize methods, etc.) to advance research and address knowledge gaps by reviewing national activities and responding to new requests for advice.	ICES strategic plan Goal 2: understand the relationship between the impact of human activities (e.g., shipping) and marine ecosystems to estimate pressures and impacts and develop science-based sustainable pathways.	2.1; 2.5; 4.4	3 years	Report to ICES. Respond to advice requests, as applicable.
b	Evaluate test conditions, methods for collection of ballast water, or analysis of samples to inform national and/or international procedures for type approval and compliance testing of ballast water management systems.	The Convention for the Control and Management of Ships' Ballast Water and Sediments, (2004) (BWMC) aims to minimize the transfer of harmful aquatic organisms with the ballast water from ships. It is imperative that the BWMC is implemented in a scientifically valid and standardized way globally. There are science and advisory requirements related to validated methods and procedures.	2.7; 4.1	3 years	Input on the general applicability or otherwise of such conditions or methods to IMO or national regulators through meeting participation, correspondence group and/or technical paper or peer-reviewed manuscript.
c	Investigate and evaluate climate change impacts on	This work will be carried out jointly with WGITMO.	2.1; 2.5; 4.4	3 years	Contribution to a peer-reviewed manuscript

	the establishment and spread of ship-mediated nonindigenous species, particularly with respect to the Arctic.	Contributes to SICCME and ICES high-priority action area 'Arctic research'.			(with WGITMO as the lead).
d	Investigate and evaluate methods/technologies to assess risks of, to minimize extent of, and to respond to vessel biofouling to inform national and/or international policies or guidelines.	This work will be carried out jointly with WGITMO. Ships' biofouling is, with ballast water, a primary bioinvasion vector. As management of invasion vectors is the only effective way to reduce risks of new invasions, addressing biofouling issues is of high priority in bioinvasions management.	2.7; 6.1; 6.4	3 years	Strengthen ties to the IMO GloFouling partnerships through meeting participation and increased discussion of research aims; report to ICES.
e	Evaluate the development of DNA- and RNA-based molecular tools for surveillance and monitoring of ship-borne invasive species.	Considering the complexity of the taxonomic groups to which invasive species belong, the decline in taxonomic expertise, the need for robust monitoring efforts, and the need for reliable and accurate methods to assess compliance to regulations (e.g. BWMC), RNA- and DNA-based molecular tools have been proposed as complementary approaches to traditional methods. Although some challenges remain, these methods warrant close scrutiny.	1.6; 4.4	3 years	Input on the general applicability or otherwise of such methods to IMO or national regulators through meeting participation, correspondence group and/or technical paper or peer-reviewed manuscript.

Summary of the Work Plan

Year 1	Working on all ToRs, but with special focus on ToRs a, e, and d.
Year 2	Working on all ToRs, but with special focus on ToRs a, b, and c.
Year 3	Report on all ToRs.

Supporting information

Priority	The work of the Group forms the scientific basis for essential advice related to the movement of invasive aquatic organisms and pathogens via ballast water and other shipping vectors. As a joint working group, it also follows and supports related work within the IMO and IOC.
Resource requirements	The research programmes which provide the main input to this group are already underway, with resources provided by national governments and scientific funding agencies. The additional resources required to undertake activities in the framework of this group are negligible.
Participants	The Group is normally attended by some 25-35 members and guests, but has more than 65 members in total.
Secretariat facilities	None.
Financial	No financial implications.

Linkages to ACOM and groups under ACOM	The group will serve as primary respondent to incoming advice requests on various issues related to ship-mediated introductions.
Linkages to other committees or groups	There is a very close working relationship with WGITMO. Potential or occasional linkage with WGBIODIV, WGHABD, WGIMT, WGPME and WGZE.
Linkages to other organizations	International Oceanographic Commission (IOC), International Maritime Organization (IMO), North Pacific Marine Science Organization (PICES). In addition, the outcomes are relevant to other national and international organizations involved in the development of regulatory policies.

Working Group on Spatial Fisheries Data (WGSFD)

2018/MA2/HAPISG03 The **Working Group on Spatial Fisheries Data** (WGSFD), chaired by Roi Martinez, UK, and Neil Campbell, UK, 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	24–28 June	Lysekil, Sweden		
Year 2020	8–12 June	by corresp/ webex		physical meeting cancelled - remote work
Year 2021			Final report by Date to SCICOM	

ToRs descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Analyse current AIS datasets available to the WG, their fitness for purpose in provision of advice, and investigate possibility of inclusion of AIS data in the annual request from ICES to its member countries to provide spatial fisheries effort data to the data centre ("the ICES VMS datacall").	For advice processes for among others DG-ENV, it is required to analyse AIS data. To ensure a smooth transition to including AIS data in advice products, best practices and logistics need to be evaluated	3.2; 3.3; 3.5	Year 1-3	Section in WG report which can be forwarded to WKBEDPRES2 describing current best practice, data gaps and approaches to data handling
b	Evaluating need and possibility to move towards higher spatial resolution in the ICES VMS datacalls	Using interpolation methods, make a voluntary test datacall for a couple of countries within WGSFD on submitting data on c-squares on a 0.01 degree resolution instead of the current 0.05 degree resolution.	3.2; 3.5	Year 1	Section of WG report detailing analysis of the change in fishing footprint when increasing to higher spatial resolution. A consideration of risks and other issues (e.g. confidentiality, credibility) in

		The possibility of higher resolution fishing pressure data for merging with habitat data has been discussed during the ICES workshops WKFBI, WKBENTH, WKTRADE, and can provide input for the upcoming ICES WGFBIT and WKBEDPRES2.			interpolating at finer scales than present should also be provided.
c	Develop spatial effort indicators for static gears	In order to estimate the effort of the passive fishing gear, other parameters (soaking time, gear length, number of hooks etc.) are needed. During the next term, WGSFD will further evaluate whether these parameters can be estimated from VMS, fleet characteristics and observer data to produce speed filters and describe typology of various fishing events for different gear categories.	3.5; 5.4; 6.1	Year 1-3	Sections in working group reports to ICES containing: i) spatial maps of fishing activity, and ii) fishing effort maps through parameterization of soak times / gear lengths / hook number.
d	Identifying potential drivers and describing spatial conflicts of fisheries in the past and future on displacement of fishing activities over various time-scales	Fisheries territories are defined by operating conditions and fish availability. Fish resources displacement due to the climate change, management measures and other human uses (MPA, marine traffic, gravel extraction, wind farms, oil rigs, seismic survey) may result in displacements when competition occurs for a given space. Through the ICES datacalls on VMS and logbook data we now have the information available to estimate the spatial variability of fisheries over time. By this we will explore drivers of fisheries displacement and develop predictive models to infer potential fisheries reallocation in a conflicting event.	5.4; 6.1; 6.2	3 years	Peer-reviewed paper
e	Support to WKBEDPRES	To ensure compatibility with WKBEDPRES1 and WKBEDPRES2, WGSFD will provide guidance on using other data sets to assess the distribution and extent of physical disturbance to the seabed.	NA		WG Report section providing strategic guidance and criteria for the collection, management, quality assurance and reporting of non-fisheries spatial data.

f	WGSFD is requested to analyse and produce maps of bottom contacting fishing activity in NEAFC areas using the VMS and logbook information collected by NEAFC. These maps should be made available to WGDEC to ensure they can be combined by WGDEC with new information on distribution of vulnerable habitats.	In analysing and producing maps of fishing activity in NEAFC areas using the VMS and logbook information collected by NEAFC, WGSFD will ensure that WGDEC have the required fishing activity layers to produce a first draft advice sheet that address the annual advice request, "NEAFC requests ICES to continue to provide all available new information on distribution of vulnerable habitats in the NEAFC Convention Area and fisheries activities in and in the vicinity of such habitats, and provide advice relevant to the Regulatory Area and the above mentioned objectives." The draft NEAFC VME advice produced by WGDEC (with input from WGSFD) will be submitted for further consideration by a review group (RGVME) and advisory committee advice drafting group (ADGVME).	NA	year 1	Maps provided to WGDEC by 30 May 2019.
g	In preparation for future advice requests for electronic advice outputs at higher resolution (c-square at 0.05° x 0.05°), WGSFD will: 1) Analyse the extent of aggregated international VMS data subject to anonymity issues (≤ 3 number of vessels) 2) Discuss different procedures to preserve anonymity (gear groupings, area grouping, international grouping, …) 3) Approve on a method/s that optimizes the data product while preserving the anonymity.	To ensure vessel anonymity in electronic advice outputs at a higher resolution, aggregated international effort values of any c-squares containing three vessels or less will not be shown (see ICES VMS data call 2019). ICES Secretariat/Data centre will filter the sensitive data in the aggregated international fishing effort (3 vessels or less) and present the group with different scenarios. The agreed upon method will contain as much information as possible (spatial or as fishing effort value) while preserving the vessel anonimity.	3.3, 3.5	year 1	Section in the WG report which can be referred to in future advice processes.

Summary of the Work Plan

Year 1	Continuing WGSFD work from 2016–2018 on improving methods and ensuring high quality of VMS/logbook data processing from data request formats, quality checks and processing data to be implemented by the ICES data centre. Address the ToRs-Identification of best practices for the standardization of AIS VMS data/Logbook. Quality Assessment and Harmonization of the available AIS data Evaluation of the comparative advantage of integrating AIS and VMS in the calculation of indicators.
Year 2	Address ToRs with aim to provide methodological guidance in analysing VMS/Logbook/AIS data and showcase results of interest to a wider audience. Invite ICES states to provide AIS + VMS + Logbook aggregated data. Further evaluation of the comparative advantage of integrating AIS and VMS in the calculation of indicators.
Year 3	Address ToRs with aim to provide methodological guidance in analysing VMS/Logbook/AIS data and showcase results of interest to a wider audience. Extension of the AIS data submission to all countries. Quality Assessment of the AIS data provided.

Supporting information

Priority	WGSFD work in 2013-2018 has proven that there is a demand for fine scaled spatial fisheries information. Outputs on fishing intensity from WGSFD have been requested by OSPAR and HELCOM for work on MSFD descriptor 6. Outputs can also be used for ecoregion advice as well as in descriptions of fisheries activity. WGSFD will in 2019-2021 focus on showcasing the value of the information in terms of understanding fisheries behaviour, applicability for fisheries management and advance methodology development to best analyse the spatial datasets at hand. ToRa: as physical disturbance from bottom-contacting fishing gear is likely to be a substantial contribution to the total extent of physical disturbance, particular attention is needed to define an appropriate method or methods for this type of disturbance. Two main sources of data are currently used to map the distribution and intensity of bottom-fishing activity: Vessel Monitoring System (VMS) data, which is coupled with fishing logbook data, and Automatic Identification System (AIS) data. VMS data have been used by ICES, FP7 Benthis project and others; AIS data have been used by JRC (JRC Blue Hub) and EMODnet. Building upon the evaluation of these data types (ICES WGSFD 2016), and considering the differences in data availability, resolution and outcomes of their processing, a comparative analysis in selected study areas is needed to assess their relative merits for MSFD purposes. TORa should thus compare the use of VMS and AIS data, and associated data required to determine fishing effort and type, such as fishers' logbooks, in the context of use for MSFD D6 assessments. This should include a side-by-side comparison against a number of parameters, including source of the data (who holds the raw data), availability (e.g. legal requirements, including vessels to be covered), ac-cessibility (including any costs, restrictions such as due to data sensitivity, ease of access), use (e.g. restrictions on its release), spatial coverage in European waters, temporal coverage (his-toric, and within year), resolution (spatial granularity), accuracy, technical requirements for processing (to define when vessels are physically disturbing the seabed), resources needed (e.g. technical expertise, time per unit area). The comparison should include maps showing the distribution of bottom-fishing activity from the two data sources for the same time period, indicating where the distribution overlaps and where not, with an associated quantification of this (e.g. number/proportion of grid cells per subdivision for AIS only, VMS only and both) and explanations for any differences. It should be noted that other electronic monitoring systems (e.g. GPS and cell-

	phone based systems) are being developed in some regions, for use by smaller vessels. The work should be carried out in close collaboration with EMODnet and JRC.
Resource requirements	VMS/Logbook/AIS data requested in ICES data calls
Participants	The Group is normally attended by some 20–25 members and guests.
Secretariat facilities	Assistance from ICES Data Centre in hosting VMS/logbook/AIS data as well as quality checking and implementation of methods developed by WGSFD. Possibly meeting facilities.
Financial	Resources for ICES Data Centre to host and process VMS/logbook/AIS data.
Linkages to ACOM and groups under ACOM	ACOM
Linkages to other committees or groups	WGDEC, DIG, WGBYC, WGECO, WGMHM, BEWG, WGHIST , WKBEDPRES
Linkages to other organizations	OSPAR, HELCOM

Working Group on Biological Effect of Contaminants (WGBEC)

2018/MA2/HAPISG04 The **Working Group on Biological Effects of Contaminants** (WGBEC), chaired by Juan Bellas, Spain, and Steven Brooks, 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 2019	11-15 March	Vigo, Spain		
Year 2020	2–6 March	Lisbon, Portugal		Joint meeting with MCWG and WGMS
Year 2021			Final report by DATE to SCICOM	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Review and report new developments and innovative methods to study and monitor effects of contaminants	There is a continuous development of new techniques by which to monitor effects of contaminants. The use of "old" methods needs evaluation and development. For 20 years, WGBEC has maintained a list of recommended methods for marine monitoring, ensured that there are protocols available (mainly through TIMES publications) and developed quality assurance programmes. WGBEC competence has been used to develop programmes elsewhere, e.g. the Baltic, and	4.4	year 2	Annual report to ICES, TIMES manuscript

		contributed to the development of MSFD (descriptor 8).			
b	Review and synthesise environmental effects of natural and synthetic particles and evaluate their direct effects and interacting effects on marine biota	Particles are critical to understand the behaviour of contaminants in marine ecosystems. Some anthropogenic activity leads to increased input of particles, some of which are associated with chemicals, others providing surfaces for adsorption. Particles will also affect organisms per se. Anthropogenically derived particles include micro- and nanoplastics, nanoparticles, mining dischages and discharges from offshore drilling.	3.1; 3.2; 6.1	year 3	Annual report to ICES, scientific paper
c	Investigate and synthesise the direct and indirect effects of ocean contamination to human health	Contaminants/pollution is one of the human pressures on marine ecosystem health resulting in human health impacts. In addition to direct effects, chemical pollutants can decrease the resilience of marine ecosystems, affect sea food security production/ resources, and may ultimately contribute to a loss of biodiversity. Several analytical and biological effect methods suggested by the ICES community can be used to establish links with human health.	5.8; 6.1; 6.4	year 3	Scientific paper
d	Update and summarise national activities on effect-based monitoring, evaluate different approaches taken and identify gaps and future avenues	WGBEC members have contributed significantly to the development and implementation of effect-based monitoring programmes in European countries, as well as OSPAR and MSFD. Monitoring is being harmonised throughout Europe as a result of WFD and MSFD, but there are still differences in take-up and implementation. Through its membership, WGBEC is uniquely placed to maintain an overview of national programmes and discuss pros and cons for different approaches.	3.1; 3.2; 6.1	3 years	Annual report to ICES
e	Describe and evaluate interaction of contamination ettects with those of climate change and acidification	Contaminant exposure is not the only stressor in marine ecosystems and it is important for WGBEC to review effects of climate change and acidification-related stressors and how their presence interact with contaminant stress.	2.1; 2.2	year 3	Scientific paper
f	Review and assess effects of contaminants of emerging concern	WGBEC originally requested MCWG to inform about substances of emerging concern since they generally would appear in chemical analyses. The definition of "emerging" has been so wide and important effects have been observed in marine organisms following exposure to e.g. pesticides, so WGBEC have included the item on the work programme.	2.1; 2.2; 4.5	year 2	Annual report to ICES

g	Investigate and report effects of individual contaminants on marine communities	There is an ongoing discussion as to whether community analyses can detect effects of contaminants; they are definitely not the most sensitive in this respect. Since biodiversity, i.e. community analyses, is an important component of WFD and MSFD effect programmes, there is a clear need to develop complementary analytical methods that are specific to effects of contaminants and not influenced by other ecological factors.	2.1; 2.2; 6.1	year 2	Scientific paper
h	Review and evaluate effects of contaminants on sediment-dwelling organisms, together with critical analysis of the sensitivity of the methodologies applied	The highest concentrations of contaminants in marine ecosystems are found in sediments. The standardised toxicity tests for sediments are unfortunately not very sensitive to contaminant exposure, at least partly because the organisms that are used are those amenable to lab culture. This item was on the work programme for WGBEC 20 years ago, but there is still limited progress. New analytical techniques alongside "traditional" methods bear promise for improved methods.	2.2	year 2	Scientific paper
i	Contribute to ICES Ecosystem overviewes according to the request	Ecosystem overviews have been advanced significanly during the past years and several ICES EGs have been very active to provide input. However, there is a room for further development through adding new components on issues where ICES has expertise, such as the biological effects of contaminants, and which are essentially relevant in marine ecosystem management and policy context.	6.5	3 years	Contribution to Ecosystem overviews according to the provided guidelines/template

Summary of the Work Plan

Year 1	Update and review national monitoring programmes.
Year 2	Review effects of contaminants, including baseline studies and risk assessment; Review effects of contaminants of emerging concern; Review the study of individual effects in community studies (scientific paper) Review effects of contaminants on sediment-dwelling organisms (scientific paper) Update ToRs a, b, c, d.
Year 3	Review effects of natural and synthetic particles (scientific paper); Review progress with concepts regarding the oceans and human health (scientific paper) Review interactions of contamination effects with those of climate change and acidification (scientific paper)

Supporting information

Priority	The current activities of this Group will lead ICES into issues related to the ecosystem effects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very 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 resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 10–15 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no obvious direct linkages.
Linkages to other committees or groups	There is a working relationship with WGMS, WGEEL and WGIBAR. It is also very relevant to the Marine Chemistry Working Group (MCWG).
Linkages to other organizations	OSPAR MIME/HASEC, HELCOM, EEA

Marine Chemistry Working Group (MCWG)

2018/MA2/HAPISG05 The **Working Group on Marine Chemistry** (MCWG), chaired by Koen Parmentier, Belgium, 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	4–8 March	Evora, Portugal		Meeting in association with WG on Marine Sediments (WGMS)
Year 2020	2–6 March	Lisbon, Portugal		Joint meeting with WGMS and WGBEC
Year 2021			Final report by DATE	Venue preferably joined with WGMS

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Assemble and synthesise new information on chemical substances of emerging concern in ICES area and beyond, including residuals in higher trophic level marine species.	Provide new data – link to WGBEC- Eco-toxicology and analytical methods – sampling, extraction, detection, issues, Quality Assurance (QA/QC). Check of EU Water Framework Directive	2.1; 4.1; 6.1	3 years	Reporting to ICES, including: - synthesizing new evidence, - identification of gaps, - emphasis on concern for monitoring, - non-target screening, especially for endocrine

		(WFD) watch list and identify substances because of increasing international awareness. This includes toxins from algae blooms.			disruptors.
b	Develop novel monitoring strategy for compliance and screening tools.	The use of passive samplers (PS) increases, and sensors are in use e.g. in Ferrybox systems, and The EU GRACE project has generated comparison and validation data regarding in situ fluorescence detection of dissolved oil.	3.1; 3.3; 6.1	3 years	Reporting to ICES on use and development of PS (compliance monitoring in relation to Environmental Quality Standards (EQS)). Collect QA/QC and validation for in-situ sensors, (incl. oil, pH, CO_2 and nutrients) and screening methods.
c	Report new developments in QUASIMEME (Quality Assurance of Information on Marine Environmental Monitoring), and provide information on other proficiency testing schemes with relevance to MCWG.	Availability of high quality proficiency testing is vital to produce reliable results.	3.1; 3.3	3 years	Reporting to ICES: - provide guidance for proficiency testing, - development of test materials for new compounds.
d	Review and report of availability of new data, analytical methods and QA/QC on Ocean Acidification (OA) in coastal/shelf seas and establish link with eutrophication.	OA and understanding its importance, quantification of its impact is crucial for a variety of scientific disciplines, and for ocean health. OA is a voluntary paremeter in OSPAR CEMP but developments in QC supports are required.	1.2; 2.1; 3.2; 4.1, 6.1	3 years	Reporting to ICES: - technical guidance document on sampling, sample handling and storage, - preparation of in-house reference material for testing and validation.
e	Review and analyse QUASIMEME assessment of chlorophyll data, in particular, regarding comparability of data and potential implications for existing measurement guidance.	Solve problems for data comparability that exist for decades concerning chlorophyll measurements.	1.3; 2.1	Year 1	Publication in TIMES: manuscript on chlorophyll determination methods.
f	Review emerging issues, and international and national regulations related to contaminants	Seafood is an important dietary source of many contamminants. Several EQS are derived from human health risks.	2.1; 5.6; 6.1; 6.3	3 years	Reporting to ICES: - reference document on food and feed regulations,

	and biotxons in seafood.	Although this is not ideal for marine environmental monitoring, follow-up is imperative.			- overview on biotoxins, - monitoring emerging issues with respect to contaminants in seafood.
g	Review of the evidence of of man-made structures (such as platforms, wind farms, buoys, pipelines, cables and ship wrecks) and shipping (such as exhaust gases, spills and scrubbles) on the marine environment as a source of chemical pollution.	Amount of constructions is ever increasing. Some protective compounds used are new to the marine environment. Application is directly into the marine systems and requires follow-up and identification of knowledge gaps.	2.1; 4.5; 6.1	3 years	Review manuscript
h	Summarise and synthesise relevant information from relevant ICES expert groups on the interface with MCWG: WGMS, WGBEC, WGEEL, JWGBird, WGOH, WGPME, WGML.	MCWG is active in trying to interconnect different WGs. The intention is to have joint meetings with WGMS, there is a direct link concerning dredging activities.	2.2; 2.5; 4.1	3 years	Publication in TIMES, contributing to WGMS dredge spoil report.
i	Review and report developments in international legislative acts (incl. Marine Strategy Framework Directive (MSFD) and WFD), in particular regarding emerging and high-priority hazardous substances and associated EQS values, conversion factors and other closely related issues.	Follow-up on this matter is key in order to guide the development process for consistent application of environmental quality criteria in monitoring prgrammes. Follow-up on JRC list of chemicals that are being monitored by different countries.	3.2; 6.1	3 years, on a year by year basis.	Reporting to ICES: - setting EQS or Environmental Assessment Criteria (EAC) and conversion factors, - review manusript on emerging contaminants and risks involved.
j	Collect regional-level information to determine Trophic Magnification Factor (TMF) and Trophic Level (TL)	The use of generic TMF and TL, as required by MSFD to calculate concentrations to compare with EQS_{biota} gives rise to unacceptable inflation of uncertainty.	2.1; 6.1; 6.3	3 years	Reporting to ICES: overview of region-specific TMF, TL for target organisms and determination of highest TL.
k	Update and summarise on recent advances in nutrient analysis technique and observed nutrients trends in the	Eutrophication reductive measures need to be followed; recent improves in techniques allow better	1.2; 1.3; 2.1; 3.3	3 years	Reporting to ICES

	marine environment.	QA for low values.			
l	Respond to potentially incoming advisory requests	Science or advisory requirements.	3.1; 6.1; 6.5; 6.6	3 years, on a year by year basis.	Advice products, as appropriate

Summary of the Work Plan

Year 1	Complete ToR e). Respond to requests under ToRs i), l). Progress work towards completion of the remaining ToRs.
Year 2	Respond to requests under ToRs i), l). Progress work towards completion of the remaining ToRs.
Year 3	Respond to requests under ToRs i), l). Report on the remaining ToRs.

Supporting information

Priority	This group maintains an overview of key issues in relation to marine chemistry, both with regard to chemical oceanography and contaminants. MCWG provides input across the field of marine chemistry, which underpins the advice given by ICES, and also supports the work of national and international collaborative monitoring programmes, e.g. within OSPAR.
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 15-20 members and guests.
Secretariat facilities	Participation using electronic means should be examined and encouraged.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no obvious direct linkages.
Linkages to other committees or groups	WGMS (the aim is to have joint meetings), WGBEC, WGML. OSPAR ICG-OA, from 2019 on (first meeting Jan 2019, Aberdeeen, UK) replacing the OSPAR/ICES study group on Ocean Acidification (SGOA) ICES Data Centre
Linkages to other organizations	The work of this group is closely aligned with EU working groups under the Water Framework Directive (e.g. Working Group on Chemicals) and EU expert networks with regard to contaminants under the MSFD. Specific agenda points will be directly relevant for QUASIMEME. The group provides the basis for some advice to OSPAR.

Working Group on the Value of coastal Habitat for Exploited Species (WGVHES)

2018/MA2/HAPISG06 The **Working Group on the Value of coastal Habitat for Exploited Species** (WGVHES), chaired by Olivier Le Pape, France, and David Eggleston, 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 2019	24–28 June	Rome, Italy		
Year 2020	29 June – 3 July	by corresp/ webex		physical meeting cancelled - remote work
Year 2021	DATE June	TBD	Final report by 1 August	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Review the application of the nursery habitat concept in management of exploited species and assess the need for refinement of the definition	There is a need for a quantifiable definition in science and a pragmatic definition in management	1.4; 5.2	year 1–2	Review manuscript
b	Review and report on evidence that hard bottom and biogenic habitats support commercially important species	Lack of information on the value of structured habitats; continuation of ongoing work by expanding to additional habitat types and new aspects	1.4; 5.2	1, 2, 3	Review manuscript(s) and report to ICES
c	Collate and document lessons learned on conservation of habitat for exploited species using experiences from different countries	Many countries are defining essential fish habitat and using experiences from various countries will increase efficiency and consistency of its application in management	5.2; 6.1; 6.2	1, 2, 3	Report to ICES and perspectives manuscript
d	Analyse the contribution of juvenile abundance indices in forecasting stock recruitment to better utilize available information	There is an interest to integrate juvenile abundance indices in short-term forecasts to improve advice in stock assessement.	5.2	1, 2	Manuscript

Summary of the Work Plan

Year 1	Continue the work on ToR a and begin the writing process. Finalise the review of hard-bottom habitats and continue ToR b with the inclusion of biogenic habitats and other aspects. Initiate the work on ToR c and continue the work on ToR d, following comprehensive scoping during the previous year..

Year 2	Complete the work on ToR a and continue the work on ToR b, c and d.
Year 3	Finalise the ongoing work in ToR b, c and d and identify future research priorities or management needs

Supporting information

Priority	The current activities of this EG will lead ICES into issues related to the importance of coastal habitat for fisheries management.
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by 10–15 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no obvious direct linkages.
Linkages to other committees or groups	There are no obvious direct linkages.
Linkages to other organizations	There are no obvious direct linkages.

Working Group on Multispecies Assessment Methods (WGSAM)

2018/MA2/HAPISG08 The **Working Group on Multispecies Assessment Methods** (WGSAM), chaired by Sarah Gaichas, USA, and Alexander Kempf, Germany, 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	14–18 October	Rome, Italy		
Year 2020	12–16 October	online meeting/ by corresp.		physical meeting cancelled - remote work
Year 2021			Final report by DATE	**Change in Chair** Incoming co-chair: Valerio Bartolino Outgoin co-chair: Alexander Kempf

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Review further progress and deliver key updates on multispecies modelling and	This ToR acts to increase the speed of communication of new	5.1; 5.2; 6.1,	3 years	Report on further progress and key

	ecosystem data analysis contributing to modeling throughout the ICES region	results across the ICES area			updates.
b	Update of key-runs (standardized model runs updated with recent data) of multispecies and eco-system models for different ICES regions	The key runs provide information on natural mortality for inclusion in various single species assessments	5.1; 5.2; 6.1	3 years	Report on output of multispecies models including stock biomass and numbers and natural mortalities for use by single species assessment groups and external users.
c	Establish and apply methods to assess the skill of multispecies models intended for operational advice	This work is aimed at assessing the performance of models intended for strategic or tactical management advice.	5.1; 6.1; 6.3	Establish methods 2019, apply 2020-2021	Manuscript for methods, report on success of methods for different examples.
d	Evaluate methods for generating advice by comparing and/or combining multiple models	This work is aimed at addressing structural uncertainty in advice arising from multiple models, as applied for example management questions	5.1; 6.1; 6.3	3 years	Report on methods for comparing models and for constructing model ensembles.
e	Management Strategy Evaluation (MSE) methods and applications for mutispecies and ecosystem advice, including evaluating management procedures and estimating biological reference points	Adapting existing multispecies/ecosystem models for MSE (operating models, assessment models), visualizing tradeoffs and uncertainty for managers and stakeholders	5.3; 6.1; 6.3	3 years	Review of MSE modeling approaches. Review of visualization methods. Review of applications throughought the ICES area with lessons learned.

Summary of the Work Plan

Year 1	All ToRs, Key run Baltic, multiple models
Year 2	All ToRs, Key Run North Sea SMS (maybe others)
Year 3	All ToRs, Key Run US Northeast Shelf, multiple models

Supporting information

Priority	The current activities of this Group will lead ICES into issues related to the ecosystem effects of fisheries, especially with regard to the application of the MSY Approach. The activities will provide information (e.g., natural mortality estimates, performance of indicators) and tools (e.g., multi-model ensembles, key run models) valuable for the implementation of an integrated advice in several North Atlantic ecosystems. Consequently, these activities are considered to have a very 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 resource required to undertake additional activities in the framework of this group is negligible.
Participants	Approx 20. Expertise in ecosystem, modelling and fish stock assessment from across the whole ICES region.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	ACOM, most assessment Expert Groups
Linkages to other committees or groups	WGMIXFISH, WGDIM, WGBIFS, IBTSWG, WGECO, WGINOSE, WGIAB, WGNARS, WGIPEM.
Linkages to other organizations	None

Working Group on Cumulative Effects Assessment Approaches in Management (WGCEAM)

2018/MA2/HAPISG09 The **Working Group on Cumulative Effects Assessment Approaches in Management (WGCEAM)**, chaired by Vanessa Stelzenmüller, Germany, Roland Cormier, Germany, and Gerjan Piet, the Netherlands, will be established and 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	28 October–1 November	ICES HQ, Copenhagen, Denmark		
Year 2020	21–25 September	by corresp/ webex		physical meeting cancelled - remote work
Year 2021	TBD October	TBC	Report by DATE to SCICOM	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Develop a cumulative effects assessment (CEA) framework suited to guide science advice on the development and implementation of ecosystem-based management	While the need for CEAs is widely accepted, their actual implementation in marine planning and management processes is yet to be seen. A common framework requires a review of the differences in the factors (data, knowledge, decision-process) being considered regarding cumulative effects assessment (CEA) in relation to environmental policies, an	6.1, 6.2, 6.6,	Year 1	CEA framework suited to guide science advice on the development and implementation of ecosystem-based management.

		ecosystem approach to marine spatial planning (MSP) and regulatory processes. The framework should clearly outline: a) Science Requirements b) Advisory Requirements c) Requirements from other EGs			
b	Demonstrate the application of the CEA framework in one or more regional case studies	To advance the development of a generic CEA methodology and identify real research gaps one or more case studies will be used as a proof of concept. The initial focus should be on the North Sea and a Canadian bioregion where the CEA is conducted with the available knowledge base..	6.1,6.2	Years 2	Scientific paper describing the application of the CEA framework in one or more regional case studies.
c	Produce generic guidance on data and knowledge needs for CEA's including: using qualitative and quantitative data, accommodating uncertainty, identifying information gaps based on the application of the framework in the above case studies	The application of the framework in case studies allows to i) indicate useful tool(s) for each step, ii) show the indicative datasets and types of data required in carrying out a CEA, iii) develop straight forward visualization tools for pressures, and iv) demonstrate end products and engage with potential clients. The latter point is essential to scope the potential usefulness of CEAs as part of ecosystem advice provided by ICES	6.1, 6.2,	Year 3	Generic guidance on data and knowledge needs for CEA's.
d	Liaise with other fora or expert groups both within ICES (i.e. Secretariat, Data Centre or expert groups) as well as outside ICES (e.g. OSPAR, EEA, HELCOM, JPI Oceans, CEAF, DFO, TC, ECCC) to work towards and consolidate a common CEA framework	The consolidation of a common CEA framework requires a continuous collaboration and exchange of expertise with other groups and fora working on CEAs	6.2, 6.4, 6.5	Year1-Year 3 (ongoing)	Consolidated common CEA framework.

Summary of the Work Plan

Year 1	During the first year the linkages to other groups working on CEAs have to be identified and established. The main goal is the development of a common and consolidated CEA framework allowing to implement CEA in different settings regarding data, knowledge, and decision-processes.
Year 2	In the second year the work will focus on the application of the CEA framework in case study areas. The North Sea and a Canadian bioregion will be the first case studies since data availability and relevant scientific knowledge is most advanced.
Year 3	Emphasis will be on the provision of guidance on data and knowledge needs when applying the common framework. This guidance will lead into a final recommendation on the usefulness of CEAs as part of ecosystem advice provided by ICES.

Supporting information

Priority	The current activities of this Group will lead ICES into issues related to the ecosystem effects of all marine human activities including fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very 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 resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 20–25 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no obvious direct linkages.
Linkages to other committees or groups	There is a very close working relationship with all the groups under HAPISG. It is also very relevant to WGINOSE.
Linkages to other organizations	There are strong linkages to the OSPAR and HELCOM work on CEAs.

Working Group on Shipping Impacts in the Marine Environment (WGSHIP)

2018/MA2/HAPISG11 A **Working Group on Shipping Impacts in the Marine Environment** (WGSHIP), chaired by Cathryn Murray, Canada, and Ida-Maja Hassellöv, Sweden, will be established and 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	25-27 November	ICES HQ, Copenhagen, Denmark		
Year 2020	27–29 May 3–4 Nov	by corresp/ webex		- Incoming co-chair: Ida-Maja Hassellöv, Sweden. - 2020 physical meeting cancelled - remote work

Year 2021	Final report by Date

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Conduct strategic planning through review of national research on shipping interactions with the environment and report on priorities, knowledge gaps and opportunities for further collaboration.	ICES strategic plan Goal 2: understand the relationship between the impact of human activities (e.g., shipping) and marine ecosystems to estimate pressures and impacts and develop science-based sustainable pathways.	2.1; 2.5;	2 years	Report to ICES. Respond to advice requests, as applicable.
b	Review the intensity, geographical scope, and trends in current and future global shipping activity, including those in the Arctic and in/near marine protected areas.	The distribution and intensity of commercial shipping is increasing and there is a growing need to assess and mitigate the impacts of vessel activities on the marine environment, especially in areas of enhanced protection. The Arctic is one such area but there are a number of other productive sea areas where the shipping intensity has increased to an extent where impacts on the environment are becoming obvious.	2.1; 2.4; 2.7	2 years	Technical paper or peer-reviewed manuscript.
c	Review and evaluate methods to assess the effect of shipping on the marine environment, including cumulative effects..	Cumulative effects assessment is needed to address the sheer volume and frequency of vessel movements, the interaction and summation of multiple impact pathways, and effects which overlap spatially and manifest through time.	2.1; 2.2; 6.1	3 years	Input on the general applicability or otherwise of such methods to IMO or national regulators through meeting participation, correspondence group and/or technical paper or peer-reviewed manuscript.
d	Review and identify possible mitigation strategies for decreasing noise (from shipping) in	The impact of noise has been the topic of discussion at the Environment Committee (IMO) for years. In	2.1; 2.7; 6.1		Input on the general applicability or otherwise of such strategies to IMO

	general and specifically in sensitive areas.	parallel quite a lot of research has been carried out and it is time to summarize the knowledge and recommend action and further research.			or national regulators through meeting participation, correspondence group and/or technical paper or peer-reviewed manuscript.
e	Review and identify methods for holistic management of shipping impacts, considering possible trade-offs across impact types.	Vessel activities can have transboundary impacts and successful mitigation efforts require coordination and collaboration between trade partners. Methods for holistic management are urgently needed to balance the benefits of industry with environmental impacts.	6.1; 6.2	3 years	ICES Viewpoint

Summary of the Work Plan

Year 1	Working on all ToRs, but with special focus on ToRs a, b
Year 2	Working on all ToRs, but with special focus on ToRs c, d, e
Year 3	Report on all ToRs

Supporting information

Priority	The work of the Group forms the scientific basis for advancing knowledge related to the impacts of shipping on the environment. It is anticipated that advisory requests could soon be received concerning shipping impacts, thus it is high priority to establish a Group to address any new requests.
Resource requirements	The research programmes which provide the main input to this group are already underway, with resources provided by national governments and scientific funding agencies. The additional resources required to undertake activities in the framework of this group are negligible.
Participants	The Group has had expressions of interest from more than 30 members.
Secretariat facilities	Standard secretarial support.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	Development of ICES Viewpoint in collaboration with ACOM
Linkages to other committees or groups	Potential linkages with WGBOSV, WGITMO, WGSFD, WGMHM, WGMPCZM, IEASG

Linkages to other organizations	Potential linkages with Arctic Council, the Baltic Marine Environment Protection Commission (HELCOM), European Maritime Safety, Agency (EMSA), International Maritime Organization (IMO), National Oceanic and Atmospheric Administration (NOAA), North Pacific Marine Science Organization (PICES), OSPAR Commission and UNEP Oceans and Seas Program. In addition, the outcomes are relevant to other national and international organizations involved in the development of regulatory policies.

Resolutions approved in 2017

Working Group on Marine Sediment (WGMS)

2017/MA2/HAPISG01 The **Working Group on Marine Sediments with respect to pollution** (WGMS), chaired by Claire Mason, UK, and Maria Belzunce, 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 2018	5–9 March	San Pedro del Pinatar, Murcia, Spain	Interim report by 1 June	
Year 2019	4–8 March	Évora, Portugal		Change in Chairs Outgoing: Craig Robinson, UK Incoming: Claire Mason, UK
Year 2020	2–6 March	Lisbon, Portugal	Final report by 15 April	Joint meeting with MCWG and WGBEC

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
A	Respond to potential requests for advice as required.		2.1; 2.2	3 years	Advice
B	Dredging activities 1) Review the regulated substances and thresholds used in management of dredging activities	A major source of contaminants in marine sediments, the substances considered, their thresholds and management approaches are different in each country.	2.1; 6.1	3 years	Review document & recommendation, if required
	2) Review and recommend monitoring approaches to disposal sites		2.1; 3.1; 6.4	3 years	Review document & recommendation, if required
C	Sediment Quality Guidelines Review recent publications that may contain data to refine existing sediment assessment criteria	More data may be available to refine existing BACs / EACs; there are no existing criteria for some prioirity substances (e.g. PBDEs) for use in MSFD / OSPAR status assesments.	2.1; 3.2; 6.1	3 years	Annual updates and final report.
D	Plastic litter: To assess the relevance and the potential risk impact of (micro-) plastics in sediments and follow	(Micro-)plastics are included in MSFD Descriptor 10, are of emerging concern and can	2.1; 2.2; 2.5	3 years	Annual updates and final report.

	up of outcomes of other expert groups	be a vector for contaminant transfer to sediments, or from sediments to biota			
E	Emerging issues 1. To review and inform on the occurrence of substances of emerging concern in sediments, including platinum group and rare earth elements, as well as organic contaminants 2. To consider other forms of pollution, e.g. microbiological	Sediments are a sink for many of these pollutants, but may also be a source.	2.1; 4.5 2.1; 2.2	3 years	Annual updates and final report.
F	Impact of renewable energy devices To explore the potential risk impact in terms of inputs (corrosion, anti-corrosion agents…) and release of contaminants due to sediment scouring	Changes in hydrodynamics may release sediment-bound contaminants; there may be inputs of contaminants during installation, operation and decommissioning. This is under active research by a member of the group.	2.1; 2.2; 2.7	3 years	Report (with recommendations, as appropriate)
G	Passive sampling				
	1) To publish guidelines on passive sampling of sediments	Documents are in advanced drafts and will be completed	2.3; 3.3; 4.4; 6.1	1 year	Two ICES TIMES papers
	2) To publish a review on passive sampling techniques	A review document is at an advanced stage of drafting and will be completed	2.3; 3.3; 4.4; 6.1	1 year	Cooperative Research Report
	3) Review and update on developments	Passive sampling is an advancing area of research that could improve on existing monitoring techniques	2.3; 3.3; 4.4; 6.1	3 years	Annual updates and final report.
	4) continue to develop a database to provide information of use in developing assessment criteria for passive sampling techniques		2.3; 2.5; 3.2; 6.1	3 years	Dataset and advice to OSPAR on progress

Summary of the Work Plan

Year 1	Completion of the different draft documents on Passive Sampling (PS) and submission as two ICES TIMES papers (Guidelines on PS in sedimens) and one Cooperative Research Report on the techniques for passive sampling of marine sedments. Progress work towards completion of the remaining ToRs

Year 2	Progress work towards completion of the remaining ToRs
Year 3	Final Report

Supporting information

Priority	This Group handles key issues regarding monitoring and assessment of contaminants in sediments. The current activities of this Group will lead ICES into issues related to the understanding of the relationship between human activties and marine ecosystems (estimation of pressure and impact, …). 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 resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 10-15 members and guests.
Secretariat facilities	The normal secretarial support to an ICES Expert Group is required.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no obvious direct linkages.
Linkages to other committees or groups	There are close working relationships with Marine Chemistry Working Group (MCWG) and Working Group on Biological Effects of Contaminants (WGBEC); some members of WGMS are also members of these. The work of WGMS is also relevant to the Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem (WGEXT) and to the OSPAR Intersessional Correspondence Group on Marine Litter (ICG ML).
Linkages to other organizations	OSPAR, HELCOM, MEDPOL, EU/JRC Expert Network on Contaminants.

Working Group on Marine Habitat Mapping (WGMHM)

2017/MA2/HAPISG02 The **Working Group on Marine Habitat Mapping** (WGMHM), chaired by James Strong, UK, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2018	22-24 May	Hamburg, Germany	Interim report by 1 August	
Year 2019	3-7 June	Palma de Mallorca, Spain	Interim report by 1 August	Meeting in association with WGDEC
Year 2020	4-8 May	by corresp/ webex	Final report by 1 July	physical meeting cancelled - remote work (jointly with WGDEC)

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
A	Report on progress in international mapping programmes (including OSPAR and HELCOM Conventions, EMODnet, EC and EEA initiatives, CHARM, Mesh-Atlantic and other projects).	Capturing the presence and work of large international mapping projects is importance because (i) the WGMHM report becomes a useful 'state of the art' summary of marine habitat mapping activity, (ii) the presentations from these projects helps spread best-practice, standardisation and collaborative working within the group, and (iii) other presentations highlight relevant mapping work that may benefit the large international programmes.	3.4	3 years	Annual updates and final report
B	Review and synthesise key results from national habitat mapping during the preceding year, as well as new on-going and planned projects focusing on particular issues of relevance to the rest of the meeting. Provide National Status Report updates in geographic format in the ICES webGIS.	The current extent of marine habitat mapping and modelling means that maps are meeting at international boundaries. It is important that maps are joined internationally and in a standardised manner. This requires an understanding of the extent and distribution of habitat mapping within nation states. Equally, WGMHM are often interested in specific habitats and wish to be kept informed of specific mapping exercises on these habitats, e.g. deepwater habitats or cold water corals. The reporting of national mapping is also the primary mechanism for encouraging WG members to submit survey metadata files to the various data archiving centres. The National Progress reports also states whether member countries have purchased significant survey items, such as ships, AUVs and sonars. This provides a good opportunity for others to identify useful resources for international colloboration.	3.4	3 years	Annual updates and final report. Submission of of survey metatdata to ICES Data Center
C	Summarise recent advances in marine habitat mapping and modelling techniques, including field work methodology, and data analysis and interpretation.	This ToR provides the main avenue for mappers to coomunicate new or improved techniques to the other scientists present (and captured in the report). As such, this ToR is essential for spreading best practice and developing new methods.	3.3	3 years	Annual updates and final report. The 2018 intersessional work will be directed towards producing our first marine habitat mapping best practice document (1–2 methodological topics only)
D	Review practise about the use of habitat maps, for example mapping for the	To encourage the diversification of the WGMHM, the group also consider how marine habitat maps are used for	6.2	3 years	Annual updates and final report. The WGMHM

	MSFD, marine spatial planning, and management of MPAs; and assess the ability to use habitat maps for monitoring of the environment.	scientific and management purposes. Members of the group are often the creators of these maps and have important insights into how the maps can be used. Equally, it gives marine managers an opportunity to suggest how maps are best presented to support clarity and value for management purposes.			also made a substantial contribution to the ICES Special Request Advice 'EU request for guidance on how pressure maps of fishing intensity contribute to an assessment of the state of seabed habitats' Published 4 July 2016
E	The identification of sources of information (e.g. bathymetry, oceanography, fisheries or socio-economic) that can be used for the production and enrichment of marine habitat maps.	Many of the remotely sensed and modelled outputs that are of value to marine habitat mappers is available online. Although much of this information is centralised in large data archives, other information remains dispersed on the web. This ToR seeks to collate the important data soueces that are of value for marine habitat mapping into one database.	3.2	Year 1	An annually updated database listing important data sources suitable for marine habitat mapping
F	Identify and advance theoretical aspects of habitat mapping (e.g. landscape ecology, supply-side ecology, implications of scale etc.).	This ToR is to provide an opportunity for EG members to address the theoretical aspects of marine habitat mapping. As a science in its infancy, it is important that underpinning concepts are challenged and re-evaluated.	4.1	Years 1 and 2	Important presentations and discusses summarised in annual reports. Scientific publication assessing the influence of classification schemes on marine habitat mapping (to be submitted in md December 2017 to ICES Journal of Marine Science)

Summary of the Work Plan

Year 1	Draft and finalise the "Recommended Operating Guidelines for Assessing and Communicating Confidence in Marine Habitat Mapping
Year 2	Conduct a joint meeting with the working group on deep-water ecology (WGDEC) and collaborate a significant joint output, e.g., geo-spatial modeling of the distribution of Atlantic Vulnerable Marine Ecosystems".
Year 3	Annual reporting for remaining ToRs and comissioning of new intersessional papers and database.

Supporting information

Priority	These ToRs are essential for maintaining the WG as a focused and relavent group for marine habitat mapping. The ToRs also contribute to the disemination of innovative ideas and best practice. This in turn improves the quality and quantity of marine habitat maps.
Resource requirements	The only resouces required will be the occassional use of ICES HQ meeting rooms.
Participants	The Group is normally attended by some 10 - 15 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are no obvious direct linkages.
Linkages to other committees or groups	There is a very close working relationship with Working Groups on Benthic Ecology, Deep-Water Ecology, Marine Planning and Coastal Zone Management and Spatial Fisheries Data.
Linkages to other organizations	EMODnet bathymetry and EMODnet seabed habitats.

Working Group on Fisheries Benthic Impact and Trade-offs (WGFBIT)

2017/MA2/HAPISG04 A **Working Group on Fisheries Benthic Impact and Trade-offs (WGFBIT)**, chaired by Tobias van Kooten, Netherlands; Ole Ritzau Eigaard, Denmark; and Gert van Hoey, Belgium, will be established and will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2018	12–16 November	ICES HQ, Copenhagen, Denmark	Interim report by 14 December	
Year 2019	7–11 October	Ancona, Italy	Interim report by 1 December	
Year 2020	14–18 September	by corresp/ webex	Final report by 1 November	physical meeting cancelled - remote work

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Building from 2017 ICES work (WKTRADE, WKBENTH, and WKSTAKE) produce a framework for MSFD D6/D1 assessment related to bottom	Provide a worked example on how science can operationalize EBM (ecosystem based management) and contribute towards IEAs (intergrated ecosystem	2.1; 2.4; 2.7	Year 1, reviewed in year 3	A worked example with guidng principles, that can be reviewed by ACOM leadership and SCICOM chair/SSGs for

	abrasion of fishing activity at the regional / subregional scale and identify key ecological processes input requirements.	assessment) as ICES advice products. Links (avoiding overlaps) will be established with key experts also attending WGECO, WGDEC, WGSFD, BEWG, WGMHM, WGIMM, WGMBRED, and WGMPCZM			feedback. Specific action points, to ensure year 2 assessments can be conducted by appropriate sub region for the N. Sea, Celtic, Baltic and Barrents Seas
b	Apply the framework to make a regional assessment for the North Sea, Celtic, Baltic and Barents Seas	EU MSFD D6/D1 assessment and providing management options that can be applied also by non-EU ICES countries.	2.7; 6.3	Year 2	Regional assessments of the impact of bottom abrasing fisheries

Summary of the Work Plan

Year 1	For an EU MSFD D6/D1 assessment related to bottom abrasion of fishing activity at the regional / subregional scale identify key ecological processes required as input. Priority should be given to decide on a quantitative framework based on biological processes, and to improve the parameterisation of framework components. The framework should allow for an overall assessment of benthic status and for the exploration of alternative management options to improve GES. Worked-out examples (and findings from WKTRADE 2017) should be used to ensure that a framework for addressing the above is established. The framework should be generic enough that it allows cross regional comparison and specific enough that it addresses regional-specific trade-offs (i.e. incorporating other pressures than fisheries). The framework should take into account complementarity to the ICES Fisheries Overviews (FOs) and Ecosystems Overviews (EOs), and provide input to overviews. The group will work between sessions to ensure required information is worked up to conduct assessments using the suggested framework (in preparation for year 2 meeting and advisory products).
Year 2	Using the framework, produce aassessment (draft advice) for the Celtic Seas, Greater North Sea, Barents Sea and Baltic Sea by subregion. Consider how other ecoregions can be incorporated (e.g. Mediterranean, Black Sea, Bay of Biscay and Iberian Coast). Assessments should be conducted using the guiding principles of TAF (transparent assessment framework).
Year 3	Update advice from previous year, and produce new (draft) assessments for 3 other ecoregions (and associated sub-regions). Review framework produced in year 1, and produce technical guidelines for "a standard" ICES advice product for MSFD D6/D1 and alternative management options to improve GES. Technical guidelines for the assesment will be produced to support TAF (transparent assessment framework).

Supporting information

Priority	The activities of this Group will lead ICES into issues related to the ecosystem effects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very high priority.

Resource requirements	Experts that provide the main input to this group have been involved in successful EU funded projects (BENTHIS). It is envisoned that future funding will be availble and that this ICES working group experts can also provide an international platform to establish a consortium. This would allow to commit future resources to the group's work.
Participants	The Group is normally attended by some 20–25 members and guests.
Secretariat facilities	Meeting room facilities, as well as Assisting Sectrariat help, Data Centre support, and Professional Officer shadowing and attendance of working group meeting.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	Advice products and working groups (e.g. WGECO and WGDEC).
Linkages to other committees or groups	There is a very close working relationship with all the groups under the Ecosystem Pressures and Impacts Steering Group. It is also very relevant to the Workings Groups WGECO, WGDEC, WGSFD, BEWG, WGMHM, WGIMM, WGMBRED, WGMPCZM.
Linkages to other organizations	EU (DG-ENV, DG-MARE), RSCs (Baltic's HELCOM, North Atlantic's OSPAR, Mediterranean's Barcelona Convention and Black Sea's Bucharest Convention), JRC, STCEF

Background to establishing a new ICES working group:

ICES now plays a central role as a facilitator for the setting of methodological standards for assessing EU's MSFD D1 habitat/D6 benthic, as well as in providing further guidance to Member States (MS) for the setting of threshold values to operationalize indicators.

The underlying basis for the recent ICES advice provided to EU (DG-ENV) has come from work that started in 2016 (WKFBI, 2016) and 2017 (WKBENTH, WKSTAKE and WKTRADE). These workshops have involved several ICES working group experts (WGSFD, BEWG, WGMHM, WGDEC), experts working closely with RSCs (HELCOM and OSPAR), as well as experts from European funded projects (BENTHIS). Given the success of these workshops, it has been the wish of expert particpipants to carry on this collaborative work by establishing a new ICES working group, WGFBIT (working group on fisheries benthic impact and trade-offs).

Given the foreseen increase in ICES advisory work with regard to EU's MSFD D1 habitat/D6 benthic and given the recent international scientific advances, establishing a group would ensure continuity and avoiding having to establish each year an *ad hoc* group. Such a group with targeted 3 year TORs would attract participation/collaboration from WGECO, WGDEC, WGSFD, BEWG, MHWG, WGIMM, WGMBRED, WGMPCZM members. In addition to advisory products (D6/D1 MSFD), scientific collaboration and research papers would ensure a stronger basis for working group reports and ICES advice. Such a group would also allow for participation by key experts also involved in RSCs, STCEF, JRC work – and encourage access to data.

Envisioned work on standardised methodolgies and critreria

Parameterization of a sensitivity model for different habitats and ecoregions, will require targeted studies on benthic community longevity composition and habitat relationship. Emphasis: other regions than the N Sea, broad range of environmental conditions (grain size, depth, salinity, bed shear stress, etc.), also include epifauna (at present box/grab sampling of infauna).

Targeted studies and modelling to incorporate regional scale heterogeneity: including habitat heterogeneity, as well as heterogeneity in successional state relative to connectivity (i.e. oceanography or distance between source and sink populations, in a multi species context).

Despite ICES 2017 advice, there is still no agreed upon method to determine where status is *"good"* in relation to fishing pressure. There is also limited ecological basis for setting good environmental status (GES) threshold levels for habitats that may span across different spatial scales, across an interconnected seafloor. If non-linear

relationships exist between pressure and state of a habitat at a specific scale, the inflection point in these relationships (i.e. when a significant change in the relationship occurs) could be used to help define thresholds. However, at the current time, such thresholds have not been identified. The spatial heterogeneity in *'good status'* locations across a region may also affect recovery rates (e.g. habitat fragmentation, relative to dispersal and connectivity across the seabed).

ICES also noted in the 2017 advice that the outcome of the impact assessment (fraction of habitat unimpacted / fraction of habitat at a certain state) is dependent on the assessment method used and the spatial resolution of the fishing pressure data layer (now 0.05 x 0.05 degrees). A change in spatial resolution will result in an overall change in the assessed habitat state. This means that the setting of threshold values is method dependent.

Some of the tasks that WGFBIT would contribute towards in the next years 2018-2020 will ensure that ICES can continue to play a pivotal role in fully operationalizing an assessment of D6/D1. Some of the key milestones will include:

1) *TAF framework* – underlying assessment methods need to be understandable, transparent and accessible (TAF, link). This requires work to clean code used to run assessments and the production of a technical guidance document that describes the indicators for assessing pressure and impact on the seafloor from mobile bottom-contacting fishing, based on their ability to produce impact estimates on a continuous scale that can be used in trade-off evaluations.
2) *Benchmarking process* – the proposed pressure and impact indicators need to be reviewed and evaluated in an open workshop in terms of their MSFD assessment suitability. This needs to be done in dialogue with RSC with agreed upon guiding principles against which the benchmarking process can be run.
3) *GES thresholds* – As part of a complete technical guideline document for the operationalization of the indicators, threshold values will need to be specified. This will require scientific input in order to operationalize 1) quality thresholds for benthic impact, and 2) spatial extent of habitat that should achieve those values. Using available methods, the workshop will explore safe biological limits of impact that can be used to explore spatial up-scaling and down-scaling of GES thresholds.
4) *RSCs acceptance* – there needs to be dialogue with those management bodies and member country experts that are "end-users" of the indictors. This is an iterative process and may require training.
5) *Ecoregion calibration – targeted project and/or working group work will need to re-calibrate the proposed impact indicators in terms of regional specific conditions.*

Working Group on Marine Litter (WGML)

2017/MA2/HAPISG08 The **Working Group on Marine Litter** (WGML), chaired by Thomas Maes, UK; Francois Galgani, France; and Andy Booth, Norway, will work on ToRs and generate deliverables as listed in the Table below.

Remark: 5-day meeting = 2 x 2.5 days split between seafloor litter and microplastic ToRs

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2018	23–27 April	ICES HQ, Copenhagen, Denmark	Interim report by 31 May	
Year 2019	21–24 October	Paris, France		
Year 2020	12–13 & 19-20 October	online meeting/ by corresp.	Final report by 1 December to SCICOM	physical meeting cancelled - remote work

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Respond to requests for external and internal advice (e.g. EU, Regional Seas Conventions, ICES Data Centre/Secretariat) as required	Science or advisory requirements.	2.1; 3.1; 6.1	Y1-3	Advice and review document as required
b	Review and report on developments in MSFD, other EU directives and international frameworks regarding marine litter	Follow-up on future needs is key to constructively guiding and supporting the development process for monitoring, threshold development and impact assessment.	6.3;	Y1-3	Annual reporting
c	Review and propose guidance for seafloor litter and microplastic monitoring and assessment to support expected ICES data needs based on the review in ToR a	The aim is to provide guidance in solving problems for sampling, data comparability and ICES data submissions.	3.1; 3.2; 3.5;	Y1-3	Annual reporting consisting of guidelines and review of Standard Operating Procedures (SOP), scientific publication
d	Propose a possible strategy or road map for ICES to follow with respect to seafloor litter and microplastic research and monitoring	Required for standardisation of monitoring and subsequent assessments	3.1; 3.2; 6.3;	Y3	Seafloor litter monitoring and research strategy for attention of SCICOM, scientific publication
e	Interact with exisiting bodies, projects and organisations e.g. OSPAR, HELCOM, GESAMP, JPIOceans to develop and report on international developments in marine litter research and monitoring	To avoid duplication of effort and improve international coordination and communication	4.1; 6.3	Y1-3	Annual reporting
f	Report new developments in quality assurance in marine litter monitoring in Europe, and provide information on other proficiency testing schemes with relevance to WGML.	Availability of high quality proficiency testing is vital to produce reliable results.	4.1; 6.3	Y1-3	Annual reporting, guidance for proficiency testing, ICES Cooperative Research Report (CRR) or Techniques in Marine Environmental Sciences (TIMES)

Summary of the Work Plan

Year 1	Respond to requests under ToR a, e & f Begin review paper to start to address ToRs c & d; Gather information on network of experts for topic to address ToR b, c & e Develop and set out matrix of knowledge gaps for remaining ToRs; Progress work towards completion of the remaining ToRs It will be important to revise current practices and activities in relation to seafloor litter and microplastic monitoring and assessment to take stock of different approaches in the light of international requirements and to make future recommendations for ICES e.g. sampling methods, protocol updates, monitoring programme guidelines, analytical methods, assessment methods, gear comparisons, data statistical power of monitoring programmes and QA/QC Produce Interim Report
Year 2	Respond to requests under ToR a Progress work towards completion of the remaining ToRs Continue review paper activity to address ToRs c & d Further develop matrix of knowledge gaps in relation to national and international knowledge and produce network map and advise documents as required Produce Interim Report
Year 3	Respond to requests under ToR a Finalise review papers ready for submission for ToRs c and d; finalise matrices and interpret output to address other ToRs Produce Final Report

Supporting information

Priority	The current activities of multiple WGs and external representatives will lead ICES into issues related to monitoring and fundamental research of marine litter. Consequently, such monitoring and research activities are considered to have a very high priority with respect to the issue of seafloor litter and MPs.
Resource requirements	The research programmes which provide the main input to this group are already underway (e.g. CleanAtlantic, Baseman, WeatherMIC, …) and national/EU resources are already committed. The ICES Data Centre has already invested in the setup of a database for seafloor litter (DATRAS) and microplastics (DOME). The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The group is predicted to attract 20–25 members and guests. The group will focus on two main topics (seafloor litter/microplastics) and a 5 day meeting could be split equally to allow participants to attend all or half of the meeting depending on their interests and expertise.
Secretariat facilities	ICES Data Centre – data extractions
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are currently no linkages with ACOM, but the EG will be ready to address advisory requests if these are forthcoming.
Linkages to other committees or groups	There will be close working relationships with HAPISG EG. The planned work is especially relevant to MCWG, WGMS, WGBEC and WGIBTS.

Linkages to other organizations	PICES, CIESM, EU, JPI Oceans, GESAMP, UN, RSC, G7, G20, …

Working Group on Economics (WGECON)

2017/MA2/HAPISG09 A **Working Group on Economics** (WGECON), chaired by Rasmus Nielsen, Denmark; Olivier Thebaud, France, and Arina Motova*, UK, will be established and will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2018	11–15 June	ICES HQ, Copenhagen, Denmark	Interim report by 25 August	
Year 2019	11–14 June	Paris, France		
Year 2020	15–19 June	by corresp/ webex	Final report by 20 August	- Change in Chair: Outgoing: Hazel Curtis, UK Incoming: Arina Motova, UK - 2020 physical meeting cancelled - remote work

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	To map the current work and identify future needs for economic science in ICES, giving consideration to useful connections to international marine/ fisheries economics organisations such as IIFET, NAAFE and EAFE.	This is mostly scoping exercise within ICES, but also ensures coordination of activities with other international bodies and links to the wider scoping work in the Strategic Initiative for the Human Dimension (SIHD).	6.3; 6.4; 7.3	Years 1, 2	Annual reporting
b	To identify and report on economic data gaps that point to priorities for longer-term data collection, research, institutional needs, and researcher training in all ICES member countries; and where possible propose systems to collect missing data.	To aid prioritisation of data collection to enable quantitative analyses and estimates of economic issues for ecosystem overviews and future advice requests. The ToR also links to ICES Data Centre.	3.1; 3.2; 4.2	Years 1, 2	Annual reporting
c	To define and report on the information flow	To develop a system to support potential future	5.3; 6.1; 7.6	Years 2, 3	Annual reporting

	needed to provide economic analysis of trade-offs relating to ecosystem-based management of fishing.	advice requests and development of ecosystem overviews			
d	To assess and report on the economic significance of commercial fishing for selected coastal regions in the ICES area	To support future potential advice requests and development of ecosystem overviews	6.6; 7.1; 7.2	Years 2, 3	Annual reporting, potentially also scientific manuscript

Summary of the Work Plan

Year 1	**Start mapping the current work and identify future needs for economic science in ICES (ToR a) and identifying economic data gaps (ToR b). Briefly brainstorm and discuss ideas on how to address and organise work under the remaining ToRs in year 2. Ensure establishing close connections with other relevant groups within and outside ICES. Producing Interim Report.**
Year 2	Progress work towards completion of ToR a) and ToR b). Start work on defining the information flow needed to provide trade-off analysis (ToRc) and assessing the ecocomic significance of commercial fishing (ToR d). Producing Interim Report.
Year 3	Finalise ToR c and ToR d, incl. the manuscript. Discuss and plan strategies and concrete steps for future work. Produce Final Report.

Supporting information

Priority	Nations are concerned about fish stocks and marine ecosystems not least because they can contribute to human wellbeing; therefore, these natural resources have an economic value. The economic dimension should be an integral part of marine science and scientific advice regarding the use and conservation of marine resources. Demand for science and advice to address economic considerations is increasing, but ICES does not engage many economists or address economic issues in many member countries in its existing work. The efforts of the Strategic Initiative on the Human Dimension (SIHD) with ICES have served to raise the profile of economics in the last few years, but, with a few exceptions, SIHD efforts are not comprehensively supported and informed by the work of the ICES EG. Further, none of the existing EG that address economic issues are focusing on the development of economic metrics and core economic analyses that are demanded in parts of the ICES network (e.g. further development of ecosystem overviews) and, in some cases, by clients for ICES advice. The need to expand the engagement of ICES in economics was also reflected in the outcomes of many recent meetings, especially the "Understanding marine socio-ecological systems" (MSEAS) Conference which ICES co-sponsored in Brest in 2016. Others drivers include high level aspirations for Blue Growth in European countries and globally, the interest in managing fisheries for Maximum Economic Yield and a desire to understand economic consequences of human-induced changes in the sea (WGHIST). There is also recognition in ICES, and from our clients, that it would be desirable to add economic metrics to ICES ecosystem overviews and better recognise people and their livelihoods as part of the ecosystem. Further, in the longer term, ICES growing engagement in aquaculture science will likely lead to overviews of aquaculture activity that will also require economic inputs.
Resource requirements	The group will rely on ongoing international and national research projects with active involvement of WGECON members.
Participants	This is a new Group, expected to be attended by some 20–25 participants.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	There are currently no linkages with ACOM, but the EG will be ready to address advisory requests if these are forthcoming.
Linkages to other committees or groups	The subject area of this EG has close linkage with at least the following ICES groups: WGMIXFISH, WGSEDA, WGIMM, WGRMES, WGNARS, WGHIST and the Strategic Initiative SIHD.
Linkages to other organizations	International Institute of Fisheries Economics and Trade (IIFET), North American Association, of Fisheries Economists (NAAFE), European Association of Fisheries Economists (EAFE), EU Scientific, Technical and Economic Committee for Fisheries (STECF), Food and Agriculture Organisation of the United Nations (FAO)

Working Group on the History of Fish and Fisheries (WGHIST)

2017/MA2/HAPISG10 The **Working Group on the History of Fish and Fisheries** (WGHIST), chaired by Ruth Thurstan, UK, and Emily Klein, 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 2018	4–7 September	Brest, France	Interim report by 1 December	
Year 2019	17–20 June	Penryn, UK		
Year 2020	15–18 June	by corresp/ webex	Final report by 15 August	physical meeting cancelled - remote work

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Collection and assembly of metadata on marine social-ecological systems through time, and further development of data products and best practices that encourage the use of these resources.	Data from WGHIST supports the development of tools for marine living resource management and provides data to the global community via the ICES Data Centre. In addition, WGHIST can work with ICES Data Centre to identify opportunities for promoting and facilitating access to and the digitization of historical and archival resources housed by other institutions. WGHIST can also develop guidelines for the use of and best practise in using long-term/historical data in research and management.	4.1; 6.1; 7.7	All years	Digital products, such as indexing WGHIST metadata on the ICES Spatial Facility. Guidelines on best practice within ICES and beyond when using and/or applying historical data to contemporary advice and/or management.
b	Review outcomes of WKIHSD meeting and peer-reviewed research from the historical ecology community, and from these consider preparing brief overviews of key historical information for submission to ICES Ecosystem and/or Fisheries Overviews.	ICES Overviews present an opportunity to increase the visibility of available historical data via brief summaries that include key aspects of specific ecoregions/fisheries (e.g., historical pressures, year of commencement of significant fishing activity, historical landings, historical distribution of fishing/other activities compared to today). WGHIST proposes to submit information, based upon the outcomes of WKIHSD and peer-reviewed research from the historical ecology community, on a number of ecoregions and/or fisheries in a form similar to 'Trends in Non-Indigenous Species', for consideration for inclusion in ICES Overviews.	5.4; 6.6; 7.7	All years	Overview text, suitable for inclusion in ICES Overviews (in a comparable format to Trends in Non-Indigenous Species), on key historical activities and data available on ecoregions and/or fisheries.
c	Evaluate changes in marine ecological and social-ecological systems through time	The interdisciplinary nature of WGHIST, with expertise in marine ecology, fisheries biology, historical ecology, palaeoecology, social and	2.2; 5.4; 7.7	All years, culminating in	Submission of (1) manuscript reviewing the development of major fishing technologies through time, and the ecological, social

	via cross-disciplinary collaboration, and demonstrate the importance of this knowledge for contemporary science and management.	environmental history, offers a unique forum for conducting research into marine social-ecological systems and the scale, direction and drivers of social-ecological change through time.		year 3	and/or cultural changes facilitated by these innovations; and/or (2) manuscript on the benefits and challenges of cross-disciplinary collaborative work.
d	Continue to use non-traditional data sources and approaches for advancing our knowledge of change and dynamics in marine ecological and social-ecological systems through time.	Several members of WGHIST work with unconventional resources and approaches, and are well versed in using interdisciplinary methods to extract non-traditional data and interpret trends over long (decadal to centennial) periods of time.	1.9, 4.1, 7.7	All years, culminating in year 3	Submission of manuscript or alternative (WGHIST report) on non-traditional methods, approaches (e.g. empirical dynamic modelling, time series analysis), their outcomes and application (e.g., data poor fisheries).

Summary of the Work Plan

Year 1	In Year 1, WGHIST will work with the ICES Data Centre to explore the opportunities for developing data products that encourage use of and enhance the visibility of historical and long-term data (ToR a). Work on the proposed manuscripts (ToRs c, d) will also commence during the Year 1 meeting, as will identification of historical data/literature for the ecosystem overviews (ToR b). Potential areas of interest already identified by WGHIST members for ToRs c and d include: quantifying changes in ecosystem services over time, detailing fishing technology change and cumulative impacts upon fishing efficiency, and invoking cross-disciplinary knowledge to expand our understanding of linked social-ecological system change through time. Post-meeting work will involve soliciting contributions from the wider WGHIST membership list and continued development of manuscripts. WGHIST will also support WKIHSD with data resources and expertise (ToR a). The WGHIST 2018 meeting will also re-establish links with the ICES SIHD and other WG with expertise relevant to WGHIST aims, through invitation of SIHD and WG Chairs to the WGHIST meeting, whether in person or remotely, and by the WGHIST Chairs remaining in communication with SIHD and other WG throughout the year. These efforts aim to strengthen cross-disciplinary ties and enhance communication and learning among ICES WGs. Links with external groups (e.g. Oceans Past Initiative) will also be maintained to enhance interdisciplinary learning and collaboration.
Year 2 and 3	In years 2 and 3 WGHIST will continue to develop digital tools for historical metadata, explore opportunities for improving the accessibility of historical data for use by the scientific community, and develop protocols for best practise when using historical data, potentially in collaboration with the ICES Data Centre and other WGs. While these tools will be finalised in year 3, it is our hope that progress will be ongoing throughout years 1 and 2, including the provision of digital updates to the ICES community during this time. If so, this will afford WGHIST members and the wider ICES community multiple opportunities to make use of these tools and feedback to the Chairs and Data Centre on these tools, thus enabling the tools to be improved over this iteration. Years 2 and 3 will also see progress on the proposed manuscripts and ecosystem overviews,

	and the WGHIST chairs will work to maintain and enhance connections with SIHD and other relevant WG, as above. Year 2 will forward manuscript and guidelines in our ToRs, which will be circulated among WGHIST members in between the metings. This circulation may include scientists and practitioners with targeted expertise outside WGHIST. In both years, specific research from WGHIST will be used to expand this work. Deliverables will then be completed in Year 3.

Supporting information

Priority	The value of historical marine ecology for evaluating current ecosystem health and providing appropriate baselines is now well published. In addition, understanding social-ecological system change has great potential for greater appreciation of both the system resilience and how they may change in the future. **Scientific Scope:** WGHIST 2018-2020 will focus on operationalizing historical data for current scientific questions and management needs. In particular, this iteration of WGHIST will emphasize increasing the visibility and accessibility of historical data to ICES and the wider scientific community, and conducting interdisciplinary research that improves our understanding of social-ecological change through time and the impacts these changes have had, and continue to have, upon fisheries provision.
Resource requirements	WGHIST will continue consultation with ICES Data Centre staff. Future Data Centre staff attendance will be an asset to WGHIST, but if this cannot be achieved in person, remote connections worked well during the previous iteration and will be leveraged. WGHIST co-chairs will also be contacting SIHD chairs to discuss their interest and ability to attend future meetings, again either in person or remotely. Any assistance ICES can provide for supporting remote access to meetings is greatly appreciated.
Participants	WGHIST predicts attendance of 8-15 group members and guests each year. These will include ecologists, historians, social scientists, economists, policy experts, data analysts working in or connected to historical marine ecology. In addition, we will invite guests in contemporary management and policy, and in the social sciences, who may participate remotely.
Secretariat facilities	None in 2018 or 2019. Meeting rooms and ability for participants to access the meeting at ICES HQ remotely in 2020.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	WGHIST will actively seek out connections within ACOM for the application of historical ecology work into scientific advice (e.g. stock baselines, change through time, context for IEAs, etc).
Linkages to other committees or groups	Direct support of WKIHSD. Potential links to ACOM, EPDSG, HAPISG, IEASG, SIHD as well as WGBIODIV, WGBFAS, WGECO, WGMARS, WGMIXFISH, WGRMES, WGSAM, DIG and WGSEDA, depending on interest and availability of committee and group members to join in person or remotely.
Linkages to other organizations	There is interest for the European Commission in regards to MSFD baseline development as well as Integrated Ecosystem Assessments. Participants in the Oceans Past Initiative (OPI) will also be interested in our work and outcomes, and WGHIST will promote connections with this group. Finally, WGHIST has an international participation beyond ICES member countries, including Australia, South Africa, and Italy.

Working Group on Methods for Estimating Discard Survival (WGMEDS)

2017/MA2/HAPISG03A **Working Group on Methods for Estimating Discard Survival** (WGMEDS), chaired by Tom Catchpole, UK, and Sebastian Uhlmann, Belgium, will be established and will work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2017	27 Nov-1 Dec	Olhão, Portugal	Interim report by 1 February 2018	
Year 2018	29 Oct-2 Nov	Mundaka, Spain	Interim report by 1 February 2019	
Year 2019	4–8 November (tbc)	Dublin, Ireland	Final report by 1 February 2020	

ToR descriptors

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Review and update guidance on 'Methods to Estimate Discard Survival' based on further theoretical and practical developments to assess discard survival levels.	a) Science Requirements b) The European Commission requested an EG develop Methods for Estimating Discard Survival to address the need for guidance on methods.	2.7; 3.1; 4.1; 6.4	3 years	Report on developments in methods and amendments or corrections required on the ICES CRR on Methods to Estimate Discard Survival, February 2020
b	Based on meta-analysis of discard survival data and practical studies, investigate variables influencing survival probabilities, with a view to increase survival through modified fishing practices.	a) Science requirements	2.1; 6.1; 6.4	2 years	Peer reviewed paper, February 2019
c	Review ongoing monitoring requirements and methods and recommend amendments that generate data which inform on the survival probabilities of released marine organisms	a) Science Requirements Promote i) the development of methods for assessing the vitality of animals released from commercial and recreational fisheries; including the validation of vitality assessment as proxy estimates of	1.6; 2.7; 3.1; 6.1	2 years	Report, February 2019

		discard survival and assessing the utility of stakeholder self-sampling; and ii) advice on effective sample sizes to estimate discard survival within confidence limits at fisheries scales.			
d	Application of discard survival estimates in fisheries management. Being proactive in engaging with other EGs to share new knowledge on discard survival.	a) Science Requirements b) Advisory Requirements The primary use for survival estimates has been in gaining exemption from the Landing Obligation. There are many other applications for this evidence relevant to stock assessments, ecosystem models, and fishing gear technology, and more broadly improving catch welfare.	2.7; 5.1; 5.4	2 years	Report describing and detailing new evidence on discard survival, February 2020

Summary of the Work Plan

Year 1	Working on all ToRs, but with special focus on ToR B, and identifying points of collaboration with other WGs (ToR D).
Year 2	Working on all ToRs, but with special focus on ToR C.
Year 3	Working on all ToRs, but with renewed focus on ToR A and ToR D.

Supporting information

Priority	The current activities of this Group will lead ICES into issues related to the ecosystem effects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very 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 resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 20–25 members and guests.
Secretariat facilities	SharePoint site.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	The work of this group will enable the collection of standardised discard survival data for a number of European fisheries, and therefore will provide supporting information for the advisory groups.

Linkages to other committees or groups	The activities of this group will be coordinated by SCICOM, through HAPISG. It will work closely with WGFTFB and WGRFS, and will develop links with other WGs and advisory groups utilising data from discard survival assessments.
Linkages to other organizations	The outputs from this group will be of interest to various Regional Advisory Councils, as well as institutes and organisations conducting discard survival assessments in support of the Landing Obligation of the new EU Common Fisheries Policy and relevant institutes in USA, Australia and elsewhere.

EGs DISSOLVED in 2019

	Workshop on Cumulative Effects Assessment Approaches in Management (WKCEAM)	
	Workshop on Tradeoffs Scenarios between the Impact on Seafloor Habitats and Provisions of catch/value (WKTRADE2)	