

## Benthos Ecology Working Group (BEWG)

2014/MA2/SSGEPD03 The **Benthos Ecology Working Group (BEWG)**, chaired by Silvana Birchenough, 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 2015	4–8 May	Calvi, Corsica, France	Interim report by 30 June to SSGEPD	
Year 2016	9–13 May	Lisbon, Portugal	Interim report by 30 June to SSGEPD	
Year 2017	8-12 May	Gdynia, Poland	Final report by 30 June to SCICOM	

## ToR descriptors

ToR	Description	Background	Science Plan topics addressed	Duration	Expected Deliverables
A	Long-term benthic series and climate change	BELTS-net will aid creating the forum for further identification of major ecosystem regime shifts, seasonality and fine scale spatial variability, and as such for further consideration of the impact of climate change onto the benthos. Given the need to compile, combine and integrate different databases the identification of methodological issues in long-term series comparability is considered most important.		Years 1-3	Research paper(s)
	1. To progress towards an understanding change in the benthos, e.g. regime shifts, seasonality, fine spatial scale variability				
	2. Facilitate collaboration by further development and promotion of the BEWG Benthic Long-Term Series network (BeLTS-net)			Years 1-3	Website and discussion forum
	3. To identify methodological issues in long-term series comparability			Years 1-2	Position paper
B	Species distribution modelling and mapping	Species distribution modelling (SDM) helps understanding the distribution of species and communities. As such, it helps elaborating a scientifically-sound management of the marine ecosystem. While qualitative SDM (i.e. modelling the likelihood of occurrence of benthic feature) has been regularly applied, today attention is needed to quantitative modelling techniques (e.g. modelling densities or biomass. BEWG will therefore compare and report on the performance of different qualitative and quantitative species distribution modelling methods, e.g. methods validity, and explore the applicability of different qualitative and quantitative species distribution modelling methods, e.g. limitations, purposes, knowledge gaps.		Years 1-2	Review paper
	1. To compare and report on the performance of different qualitative and quantitative species distribution modelling methods, e.g. methods validity				
	2. To explore the applicability of different qualitative and quantitative species distribution modelling methods, e.g. limitations, purposes, knowledge gaps			Years 2-3	Position paper

C	Benthos and legislative drivers	A wide suite of benthic quality indicators were developed, intercalibrated and applied within the framework of several international regulations. At present, the most relevant directives within the Northatlantic realm are the Water Framework Directive, the Habitats Directive and the Marine Strategy Framework Directive. BEWG will investigate the Compatibility and complementarity within the use of benthic indicators and targets for management. It will further continue scientifically investigating the importance of species autecology in indicator development and application and review the development of effective monitoring programmes, e.g. design, harmonisation and quality assessments.	Years 1-2	Position paper
	1. To report on the use of benthic indicators and targets for management: Compatibility and complementarity			
	2. On the myths on indicators: To investigate the importance of species autecology in indicator development and application		Years 1-3	Research paper(s)
	3. To review the development of effective monitoring programmes, e.g. design, harmonisation and quality assessments		Years 1-2	Review paper
D	Benthic biodiversity and ecosystem functioning	Disentangling the link between biodiversity and ecosystem functioning is currently considered key to a full understanding of the health of marine ecosystems. This topic hence became a cross-cutting theme since the BEWG 2012 meeting. BEWG will therefore review and identify benthic indicators to reflect the link between biodiversity and ecosystem functioning and review how ecological function and diversity relates to different parts of the benthic communities at different spatial scales, taking account of e.g. ecological processes and biological traits. BEWG will also scope for research on the functional diversity of macrobenthos in relation to ecosystem functioning, for which a first data compilation will be dealt with intersessionally. From a more conceptual perspective, BEWG will continue investigating the link between ecosystem functioning and ecosystem services.	Years 1-3	Research paper(s)
	1. To identify the links between benthic biodiversity and ecosystem functioning, e.g. literature review, ecological processes, biological traits.			
	2. To identify the links between benthic functions and ecosystem services.		Year 1	Viewpoint paper
E	Benthic Biodiversity and conservation: to review the role of benthic ecology in relation to MPAs	Understanding ecological issues surrounding the development/proposal of MPAs and how effective MPAs are going to be for the conservation of priority benthic species. Many WG members seemed to have concerns that the levels of protection (i.e. management measures) being applied within MPAs may not	Years 1-3	Review paper
	• To identify the links between protected features and their ecological function			

	<ul style="list-style-type: none"> <li>To relate the functions of protected marine features to the main pressures that would affect these features (cause-effect analysis)</li> <li>To consider the effect of not excluding key pressures that affect the designating feature from MPAs (i.e. no take zones).</li> </ul>	<p>be adequate to protect the species in need of protection, which may put at risk the ecosystem function and traits in specific habitats.</p> <p>This ToR will consider issues associated with conservation/restoration, Autecological/environmental as well as human issues.</p>	Years 1-3	
			Years 1-3	Review paper

**F 2015/4 Support for the development of common and candidate OSPAR biodiversity indicators for benthic habitats: Benthic habitats**

ICES is requested to support on-going OSPAR indicators work on benthic habitats, in support of the requirements under the MSFD<sup>1</sup>.

a) Using mobile bottom contacting gear data, produce fishing abrasion pressure maps<sup>2</sup> (2009-2014) using the BH3 approach as a follow-up of the OSPAR request to ICES (Request 5/2014). Fishing abrasion pressure maps should be analysed by gear distribution, and type, in the OSPAR maritime area and be based on the methodology propose on the physical damage indicator (BH3). Specifically ICES is requested to:

- i ) collate relevant national VMS and logbook data;
- ii ) estimate the proportions of total fisheries represented by the data;
- iii ) using methods developed in Request 5/2014, where possible, collect other non-VMS data to cover other types of fisheries (e.g. fishing boats < 12m length);
- iv ) prepare maps for the OSPAR maritime area (including ABNJ) on the spatial and temporal intensity of fishing using mobile bottom contacting gears (BH3 approach);

b) Evaluate the applicability of a reduced list

<sup>1</sup> Any analysis relating to main threats and development of abrasion maps should not be applied to the Portuguese continental shelf

<sup>2</sup> There should be consultation with OSPAR in the drafting of the data call that will be required to deliver of this request. This should build on the experience and lessons learned from the 2014 VMS/Log book data call.

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of habitats in support the development of Typical Species indicator (BH1)<sup>3</sup>. This work should consider those habitats that have previously been identified by the COBAM Benthic experts group. Evaluation should consider data availability, and suggest possible prioritisation of habitats already included in the OSPAR list of threatened and declining habitats.

c) Evaluate monitoring and assessment requirements for multimetric indicator (BH2)<sup>2</sup> and/or typical species (BH1)<sup>2</sup>, by providing:

- i) overview of existing monitoring programmes with associated benthic sampling stations (e.g. WFD, MPA, Natura2000, impact assessment studies, etc.), taking into account the work done under the JMP project/art 11 reporting by countries.
- ii) overview of existing network of sampling stations and monitoring frequency across all OSPAR regions.
- iii) evaluation of on-going monitoring with regard to, geographical coverage, parameters consistently measured across the whole network, monitoring design and sampling strategy for assessment requirements (BH2/BH1). Evaluation should identify any gaps and indicate how they could be completed (monitoring sampling strategy and/or methods).

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G Produce four short paragraphs for the ICES Ecosystem Overviews on the benthic habitat 150 words in length and can be supported by one figure. Paragraphs for each of the following ICES ecoregions: Greater North Sea, Celtic Seas, Bay of Biscay & the Iberian coast and Baltic Sea. Each ecoregion should be similar in style and address the overall state and comment on the pressures accounting for changes in state. These will go in section four of the ecosystem overviews and not supposed to be long

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<sup>3</sup> In the implementation of this request ICES should ensure that there is a dialogue established between the relevant Working Group chairs and coordinators of the relevant OSPAR subsidiary bodies, including the ICG-COBAM Expert group for Benthic Habitats and ICG-Cumulative Effects. This is to ensure consistent interpretation of the request to meet the needs of OSPAR and avoid duplication in supporting the development and testing of OSPAR common indicators. Where data has been analysed as part of the work to deliver this request, the advice should be delivered in a form that will enable its use in subsequent analyses (including spatial analysis).

		descriptions, but a short synopsis of important points for managers and policy developers.	
H	Produce four short paragraphs for the ICES Ecosystem Overviews on the benthic community, one paragraph for each of the following ICES ecoregions: Greater North Sea, Celtic Seas, Bay of Biscay & the Iberian coast and Baltic Sea.	Each paragraph should be maximum 150 words in length and can be supported by one figure. Paragraphs for each ecoregion should be similar in style and address the overall state and comment on the pressures accounting for changes in state. These will go in section four of the ecosystem overviews and not supposed to be long descriptions, but a short synopsis of important points for managers and policy developers.	
I	<p>1) Recommend a scoring process (or relevant options for processes) for sensitivity of habitats, which should also include rules on:</p> <ul style="list-style-type: none"> <li>i. How to scale-up sensitivity to a c-square resolution of 0.05° x 0.05°</li> <li>ii. How to treat variation in habitat type when evaluating sensitivity within c-square resolution of 0.05° x 0.05°</li> <li>iii. How to interpolate and/or extrapolate information on sensitivity when habitat data is missing</li> </ul> <p>2) Based on TOR a, provide input to WGMHM.</p>	ICES has been asked by the EU (DGENV) to provide guidance in the interpretation of fishing pressure maps in relation to impacts on benthic habitats and the related indicators. WGDEC and BEWG will provide recommendations for scoring the sensitivity of habitats; these recommendations should preferably be compatible with each other. WGMHM will incorporate information on sensitivity of the benthic community of the various seafloor habitats, and will produce habitat sensitivity maps for at least one demonstration area of NW European waters (MSFD region/subregion). WGFSM will produce impact maps by combining and evaluating the benthic information on sensitivity and fishing pressure maps (fishing abrasion, weight and value of landed catch), taking into account differences in benthic impact of the various fishing gears / metiers. Following this, an ICES Workshop on guidance on how pressure maps of fishing intensity contribute to an assessment of the state of seabed habitats (WKFBI) on 31 May - 1 June 2016 will develop indicator principles and good practices for use regionally when assessing the impact of fishing on the seafloor. The workshop outputs will then be used in the ICES advisory process.	Work on ToRs 1) and 2) should be done intersessionally (January – May 2016). BEWG will report on ToR 1) and 2) as soon as possible but at the latest by 2 May 2016 for the attention of WGMHM (and of ACOM)
J	Review the content drafted for the state/trends (two paragraphs) of the benthic community/habitat for the Ecosystem Overviews of i) the Iceland Sea and ii) Norwegian Sea ecore-	Advisory request	years 2 and 3 BEWG will work intersessionally to deliver the first two ecosystem

gions.			overviews (i and ii) by the end of 2016 and during 2017 for the ecosystem overviews (iii and iv) for the attention of ACOM.
K	Provide draft text (~ 150 words and 1-2 graphs if needed) on the state and trends of the benthic community/habitat that could be used for an Ecosystem Overview for the north-east Atlantic and for the Azorean ecoregion.	Advisory request	years 2 and 3

### Summary of the Work Plan

Year 1	ToRs a.1-3, b.1, c.1-2, d.1-2, e.1-3
Year 2	ToRs a.1-3, b.1-2, c.1-3, d.1, E.1-3
Year 3	ToRs a.1-2, b.2, c.2-3, d.1, E.1-3

### Supporting information

Priority	The current activities of BEWG will continue along the three major vertical axes of priority within BEWG: long-term series and climate change, benthic indicators and EU directives, and species distribution modelling, and one cross-cutting (horizontal) axis on benthic biodiversity and ecosystem functioning (including issues directly in connection to MPAs). All issues mentioned fit the ICES Science Programme and are considered to be of high priority. The BEWG are active contributors and aim to report their outcomes directly to ICES in their annual report as well as in the peer reviewed literature, some of the outputs can be seen in ICES JMS, PLOS One, Marine Pollution Bulletin, etc.)
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 15-30 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and group under ACOM	There are no obvious direct linkages.
Linkages to other committees or groups	There is a possibility for interaction of several ICES expert groups, among which WGMHM and WGEXT.
Linkages to other organization	The group has had also interaction with OSPAR IGC-COBAM