

Condition of Benthic Habitat Communities: The Common Conceptual Approach

MSFD Descriptors: 1 - Biological diversity; 5 - Eutrophication; 6 - Seafloor integrity

MSFD Criteria: 1.6 - Habitat condition; 5.3 - Indirect effects of nutrient enrichment; 6.2 - Condition of benthic habitat community



Key Message Benthic habitats are essential for marine life. Assessing their condition against all pressure types is a huge new challenge for science and management. Initial assessment results are available for two pressure types. Further development of this common approach will integrate assessment results and include additional habitat types and pressures

Background

Benthic habitats (**Figure 1**) are essential for marine life, because marine species rely directly or indirectly on the seafloor to feed, hide, rest or reproduce. Benthic habitats are characterised by animal and plant communities with no or slow mobility when compared to fish or marine mammals. The whole benthic community is therefore exposed when a pressure occurs. As a result, the condition (quality status) of benthic habitats is a reflection of the combined effects of all the pressures to which they are subject.

This study presents the concept for a common approach for evaluating the condition of benthic habitats and their communities. The application of this common approach has been endorsed by OSPAR for the Greater North Sea, Celtic Seas, and Bay of Biscay and Iberian Coast through the adoption of a Common Indicator. It has been recognised that to assess the impact of each human pressure on the condition of each benthic habitat type, along a pressure-impact gradient, requires specific assessment methodology and scales (**Table 1**). The aim is to inform management of human activities with as full an understanding as possible of the relative effects of different pressures on benthic habitats and their communities. For example, which habitats are affected, where, by how much and for how long?

OSPAR-wide assessments of benthic habitats are at an early stage of development and this concept will be further elaborated prior to the next OSPAR Quality Status Report and subsequent assessments.

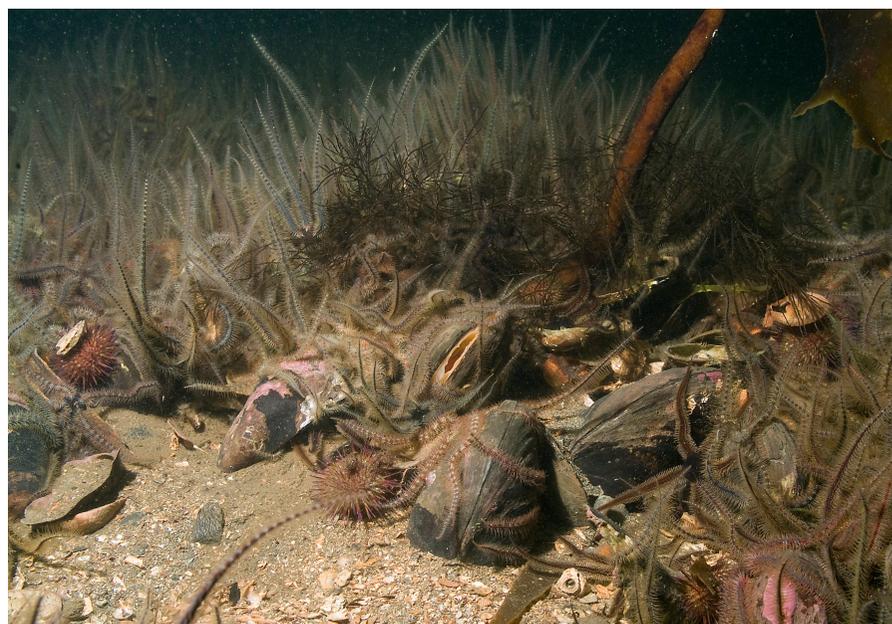


Figure 1: Horse Mussel (*Modiolus modiolus*) beds
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Table 1: Relationships between habitat and pressure types, and how / if the relationships are currently assessed or considered
Relationships based on the revised Marine Strategy Framework Directive (MSFD) - COMMISSION DECISION (EU) 2017/848) and OSPAR / MSFD pressure categories

Broad Habitat Type	Broad Pressure Type							
	Physical damage	Removal of species	Hydrological changes	Eutrophication (nutrients or organic matter)	Non-indigenous species	Contaminants	Litter	Energy, including underwater noise
Littoral rock and biogenic reef				A				
Littoral sediment				A				
Infralittoral rock and biogenic reef				A				
Infralittoral sediment	P			A				
Circalittoral rock and biogenic reef				A				
Circalittoral sediment	P			A				
Offshore circalittoral rock and biogenic reef								
Offshore circalittoral sediment	P			P		P		
Upper bathyal rock and biogenic reef								
Upper bathyal sediment								
Lower bathyal rock and biogenic reef								
Lower bathyal sediment								
Abyssal								

Key

A	Assessed and reported under the European Union Water Framework Directive (WFD)
	Considered under the European Union Marine Strategy Framework Directive (MSFD)
P	Partially assessed in the Intermediate Assessment 2017
	Main risks (potentially widespread across the OSPAR Maritime Area)
	Relationship identified but not currently assessed

Results

For the Intermediate Assessment (IA) 2017 only two condition versus pressure interactions have sufficiently developed methodologies and data availability to undertake assessments in the line with the common conceptual approach. These are coastal habitats in relation to nutrient and / or organic enrichment and species diversity in subtidal sediments in the Southern North Sea versus abrasion (by bottom trawling fisheries).

In the future, to have a better understanding of pressures on the seabed, the assessment of benthic habitats will include results from a range of assessments of specific pressures. Each set of results will differ depending on which pressure type (and thus, specific associated assessment scale) is considered. The cumulative effect of co-occurring pressures (different types of pressure at the same place and in the same time range) is not currently assessed. Further development will take place over the next assessment cycle (depending on progress in developing methods to integrate assessments and other indicators) to provide an overall understanding of the condition of benthic habitats in the North-East Atlantic. Progress on developing cumulative effects assessment is also addressed under Ecosystem Assessment Outlook.



Conclusion

Assessing the condition of benthic habitats against all pressure types within the OSPAR Maritime Area is a huge new challenge for science and management. In only a few years, experts involved in Regional Seas Conventions have developed common approaches to assess the effects of each pressure type.

Currently two habitat pressure interactions have been assessed in line with the common conceptual approach, however work to develop assessment of other habitat and pressure types is promising. Further work is needed to address knowledge gaps, monitoring and data flow needs to ensure sufficient and adequate data for an effective region wide assessment. The added value of a common approach to assessing the condition of benthic habitat communities will be realised through its application in combination with other benthic indicators. This will provide fuller understanding of the extent of the effects of pressures on benthic habitats: i.e. which habitat is affected, where, by how much and for how long has it been impacted? More extensive data and the development of methods for assessments of additional pressure-habitat interactions should, in the future, provide clearer signals and identify clearer trends to inform management needs.

Knowledge Gaps

Further methodological development is required to adapt, operationalise and implement coherently this common conceptual approach for all pressure and habitat types. Although promising, this indicator requires more development and testing to be fully operational for all OSPAR and MSFD purposes for the next assessment. An action plan to address some of these knowledge gaps has been adopted as a result of the OSPAR EcAprHA project.

Image: Biogenic reef *Sabellaria Spinulosa* © Rear Admiral Ron Jessop/Eastern IFCA

This document was published as part of OSPAR's Intermediate Assessment 2017.

The full assessment can be found at www.ospar.org/assessments