Baltic Marine Environment Protection Commission

Working Group on the State of the Environment and Nature Conservation

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Document title	Background information for how translation between different habitat classification systems used by legal instruments (EU Directives) and conventions (Baltic Sea case) has been prepared.
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Background

STATE&CONSERVATION 10-2019 took note of the work being done regarding linking habitats to red-listed species and considered how to take the work forward, including the need to validate and make the information available. The Meeting took note of an overview of available information and preliminary linking of HELCOM Redlisted species to habitats as presented by the Secretariat (the latest version can be found as **Attachment 1 to this document**). The meeting welcomed the work and expressed that the overview is very useful. The meeting noted that the identification of MSFD broad habitat types applicable in the Baltic Sea was done by the SPICE project, however expressed the wish that the excluded MSFD broad habitat types should be checked to ensure that they really do not occur in the Baltic Sea.

This document contains background information on how the delineation of various classification schemes was done under the SPICE project and provides the definitions for the MSFD broad habitat classes as proposed by Evans *et al.* in 2016. While the documentation is quite clear regarding the exclusion of the bathyal and abyssal categories, it is not fully clear why the offshore circalittoral and littoral classes have been excluded by the SPICE project and further investigation might be needed to clarify this.

Action requested
The Meeting is invited to:

- take note of the background information and use it as appropriate, in line with the request in the agenda.

Translation between different habitat classification systems used by legal instruments (EU Directives) and conventions (Baltic Sea case), as proposed by the SPICE project.

Currently three different habitat classification systems are used in the Baltic Sea area for describing and assessing status of marine habitats. Each of those is used and developed under technically different system with slightly different purpose. At the same time coordination and harmonization of assessment results is required by e.g. the Marine Strategy Framework Directive (MSFD) and national authorities as the underlying data collection and monitoring procedures are often serving assessment procedures of different instruments as well as measures applied on the basis of these assessments are often also targeting same directives. We identified three major habitat classification systems that need a translation guide to be able to transfer the information as status classification from one system to another. Existing guidance on the translation between different environmental directives is currently not very specific in taking into account Baltic Sea conditions (e.g. Evans et al 2012 and 2016).

Habitat Directive (HD)

Habitat classification system for Habitat Directive (list of marine habitat types) is based on mixture of broadscale hydromorphological, landscape level properties and some selected physical or biological features of marine benthic habitats. The list is not all inclusive, but reflects the natural features in most need of protection on European scale. Definition of each habitat type includes description of physical features of marine environment in some cases with description of characteristic biological communities or species. Differences exist in national interpretations of the definitions of habitats. Guidelines exist on assessment of the status of the habitat types and regular reporting system is in place.

Marine Strategy Framework Directive (MSFD) (Sheet 4 in Attachment 1)

Habitat classification system used for MSFD reporting consists of all inclusive list of very broadscale habitat features. It covers full range of possible habitats on the tidal shelf and open sea. Classification system includes both 'predominant seabed and water column types', often referred to as 'Predominant Habitat Types', and 'Special habitat types', which refer especially to those recognized or identified under Community legislation (the Habitats Directive) or international conventions as being of special scientific or biodiversity interest (Cochrane et al 2010). The system is compatible with EUNIS. Definitions of classification units do not include information on biological features and system does not include hierarchical divisions. General guidance on how to assess status exist and this requires information on both distribution pattern and structure of biological communities (New Commission Decision).

HELCOM Underwater Biotope and Habitat classification system (HUB)

HUB system was developed on the basis of EUNIS classification system with the aim to include also biological features of the marine habitats (HELCOM 2013). HUB is hierarchical, all inclusive system covering all possible habitats occurring in the Baltic Sea. It is built in a way to be comparable with EUNIS system. Higher hierarchical levels of this system reflect the physical properties of the habitat while lower levels (5-6) represent the biological features of the habitats. Clear classification scheme and guidelines exist for identification of the particular habitat (HELCOM 2013).

Development of translation matrix between the three habitat classification systems.

MSFD-HD (Sheet 5 in Attachment 1)

Development of translation matrix is necessary for harmonization of the assessment effort between the three different systems since currently no detailed guidelines exist on how to do that. This is especially the

case for the Baltic Sea where traditional EUNIS system can not be applied (absence of tides). For development of translation matrix between MSFD and HD classification systems the following documents were used document "Links between the Marine Strategy Framework Directive (MSFD 2008/56/EC) and the Nature Directives (Birds Directive 2009/147/EEC (BD) and Habitats Directive 92/43/EEC (HD)) - Interactions, overlaps and potential areas for closer coordination", 27 July 2012. Modifications of the recommended translation matrix were done taking into account Baltic Sea conditions and also recommendations from e.g. Evans et al 2014.

Modification of already existing translation matrix to Baltic Sea case included removing the classification units associated with tidal system from the MSFD part. As the water level fluctuation in the Baltic Sea still creates the characteristic habitats as HD 1140 these were attributed to "Infralittoral" part of the MSFD system.

The resulting matrix demonstrates that there is no 1:1 compatibility between these two systems and this goes in both directions; one classification unit of one system can include several classification units of other system. This means that for practical translation of the e.g. status classification results between those two systems more detailed, quantitative information is needed (e.g. area of different substrate types within the assessment unit) and each case should be dealt separately. Automated status translation can be done only when quantitative information is available.

MSFD-HUB (sheet 6 in Attachment 1)

For developing a proposal for translation matrix between MSFD and HELCOM HUB system available guidance documents were used (e.g. translation between MSFD and EUNIS systems provided in the new draft Commission Decision laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardized methods for monitoring and assessment, and repealing Decision 2010/477/EU) and modified them according to Baltic Sea conditions. As HUB is hierarchical system and MSFD system covers only the very broad scale features of marine environment only one HUB level (level 3) was included in the translation matrix.

Definitions of the marine EUNIS habitat classes

Definitions of the marine EUNIS habitat classes, as proposed by Evans *at al*. in 2016 (revised in 2017), on which the MSFD broad habitat types are reliant.

The following are suggested for use by EUNIS, to varying extents they are simplifications but should be workable in most situations. It should be remembered that EUNIS is based on biological zones rather than physical zones.

Littoral – the shore area or intertidal zone, where periodic exposure and submersion by tides is normal, or in non-tidal marine ecosystems, habitats which are normally water-covered but intermittently exposed due to the action of wind or atmospheric pressure changes (see hydrolittoral). It can include the splash zone, rockpools and (relatively) waterlogged saltmarshes (soft substrata) and saline or brackish pools found in the supralittoral zone above the mean water level in non-tidal waters or above the spring high tide limit in tidal waters. Since the precise physical limits of tidal range vary constantly, a biological definition of the zone, which essentially reflects typical physical conditions rather than more rarely experienced events, is generally more useful. Thus in Britain, for example, the littoral zone for rock and hard substrata includes the splash zone and is defined as the region between the upper limit of species of the seaweed Laminaria and the upper limit of Littorina (periwinkles) or of the lichen Verrucaria. (Taken from Davies, Moss & Hill 2004).

Infralittoral – Sufficient light for vascular plants such as *Posidonia oceanica* and *Zostera* spp and green algae to grow and they are often dominant. The lower limit has traditionally been considered to coincide

with 1% light penetration. "Shallow sub-tidal or non-tidal water below the mean water level, wave disturbed or algal dominated or within the euphotic zone" in Davies, Moss & Hill 2004

Circalittoral – Insufficient light for vascular plants and green algae but red and brown algae can grow and they may be dominant although usually this zone is dominated by fauna. The light penetration which coincides with the lower limit of the circalittoral, and which is marked by the growth limit of red crustose coralline algae, varies between authors and studies but is typically 0.01% or smaller. "Sub-tidal or non-tidal water, with insufficient light penetration to allow algae to dominate. May have some wave action, and tidal currents may exert a strong influence" in Davies, Moss & Hill 2004.

Offshore circalittoral – In some classifications this is called 'Deep circalittoral' or 'Deep shelf'. Insufficient light for photosynthesis and with little variation in temperature.

Bathyal – This zone corresponds to the continental slope between the edge of continental shelf (typically at 180-200m depth) and the abyssal plain. The 'shelf break' is typically at 180-200 m depth. This zone has been subdivided into upper and lower "The oceanic zone at depths of 200-2000 m, lying to seaward of the shallower neritic zone, and landward of the deeper abyssal zone. The upper limit of the bathyal zone is marked by the edge of the continental shelf. In marine ecology, it is the region of the continental slope and rise. It may be geologically active, and includes trenches and submarine canyons, with under-water erosion producing avalanches in" Davies, Moss & Hill 2004.

Abyssal – the plain below the continental shelf. "Applied to the deepest part of the ocean, below about 2000 m. The abyssal zone lies seaward of, and deeper than, the bathyal zone, and covers approximately 75% of the ocean floor. It is the most extensive Earth environment, cold, dark, with slow-moving currents (less than a few centimetres per second), supporting fauna that are typically black or grey, delicately structures and not streamlined" in Davies, Moss & Hill 2004.

References

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