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<b>Document title</b>	Methodology to assess the environmental impact of dredging
<b>Code</b>	6-1
<b>Category</b>	CMNT
<b>Agenda Item</b>	6 - Sea floor integrity – methodology to assess the environmental impact of dredging related to physical disturbance and physical loss
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<b>Reference</b>	

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## Background

EN DREDS 8-2019 discussed the methodology to assess the environmental impact of dredging related to physical disturbance and physical loss and the ongoing work at HELCOM and ICES. The work has progressed in both organizations and the Secretariat will present the latest work of HELCOM working groups to define the ecological objectives for Physical loss and physical disturbance and also the latest work in ICES, including the final advice from ICES to the European Commission.

It should be also recalled that PRESSURE 11-2019 ([outcome](#), annex 3) proposed to implement the [2018 Ministerial declaration](#) regarding physical loss and physical disturbance.

The latest ICES documents are attached to this document, [6-1-Att.1 ICES advice to EU 2019.25](#) and [6-1-Att.2 WKBEDPRES2 Report 2019](#).

## Action requested

The Meeting is invited to take note of the information.

The Meeting is invited to consider the group's potential involvement and contribution to this work.

## HELCOM work on defining ecological objectives

Below briefly described the work done by different HELCOM groups and what has been stated in the recent outcomes. The Meetings are in chronological order.

### PRESSURE 10-2019:

Loss and disturbance to the seabed was recognized as closely linked to ecological objectives on biodiversity and that further consideration is needed to differentiate between an ecological objective for “loss and disturbance” and status of benthic habitats in general. It was proposed that the State and Conservation Working Group discuss this matter further.

### STATE & CONSERVATION 11-2019:

Loss and disturbance to seabed habitats

**Ecological objective:** Activities affecting seabed habitats do not threaten the viability of species and communities

**Management objectives:** Reduce, prevent and mitigate pressures and impacts from activities that are causing loss and disturbance to seabed habitats

### HOD 57-2019:

Agreed in principle on the revised and proposed new ecological and management objectives as part of the provisional framework for the update of the BSAP (**Annex 2**), while keeping it open for adjustments to individual objectives or proposals on additional objectives as found relevant in the further BSAP update process.

Goals	Environmentally sustainable sea-based activities
Ecological objectives	<ul style="list-style-type: none"> <li>- No or minimal disturbance to biodiversity and ecosystem from sea-based activities</li> <li>- Activities affecting seabed habitats do not threaten the viability of species' populations and communities</li> <li>- No harm to sea life from manmade noise*</li> </ul>
Management/conservation objectives	<ul style="list-style-type: none"> <li>- Minimize loss and disturbance to seabed habitats from sea-based activities [<i>by pressure reduction, prevention, and mitigation measures</i>]</li> <li>- Ensure noise levels do not adversely affect [<i>noise sensitive species and do not injure</i>] sea life*</li> <li>- No introductions of non-indigenous species</li> <li>- Minimize the contribution to eutrophication and hazardous substances and litter from sea-based activities</li> <li>- Enforce international regulations – no illegal discharges</li> <li>- Safe maritime traffic without accidental pollution</li> <li>- Effective emergency and response capabilities</li> <li>- Minimize harmful air emissions</li> <li>- Zero discharges from offshore platforms</li> <li>- Ensure sustainable use of the marine resources</li> <li>- Maritime Spatial Planning applying an ecosystem-based approach throughout the Baltic Sea*</li> </ul>

Table 1: Objectives indicated with an asterix (\*) received specific comments as outlined in the outcome HOD 57-2019 and will be considered in the further adjustment of objectives. Text in brackets includes text that is proposed to be deleted from the objectives and instead reflected through actions; it is kept for the time being until these aspects are reflected in the updated BSAP. The use of the term 'sea life' will be further considered for all objectives where it is used.

## ICES

ICES has been working to produce an advice that is a response to two requests from the European Commission (DG ENV); one on D6C1 physical loss pressure and D6C4 habitat loss, and the other on D6C2 physical disturbance pressure.

The attached document 6-1-Att.1 is the final advice from ICES, and the document 6-1-Att.2 is an ICES scientific report from the WKBEDPRES2 workshop. The three workshops in this process - WKBEDPRES1, WKBEDLOSS and WKBEDPRES2 – form part of a stepwise process that will deliver advice on seafloor integrity for the Marine Strategy Framework Directive (MSFD).

The entire documents can be read from the attachments, but below one can find a few extracts from these documents relevant for the methodology to assess the environmental impact of dredging and depositing dredged material, regarding physical loss and physical disturbance.

### Definition of Physical loss and physical disturbance

*ICES advises are based on the following definitions of physical disturbance and physical loss:*

**Physical loss** is defined as any human-induced permanent alteration of the physical habitat from which recovery is impossible without further human intervention. An alteration of the physical habitat refers to a change from one EUNIS level 2 habitat type to another EUNIS level 2 habitat type. Recovery indicates the re-establishment of the original natural EUNIS level 2 habitat by means of a human intervention. Two types of physical loss are identified:

- *Sealed physical loss results from the placement of structures in the marine environment (e.g. wind turbines, port infrastructure) and from the introduction of substrates that seal off the seabed (e.g. dredge disposal).*
- *Unsealed physical loss results from changes in physical habitat, either from human activities or from the indirect effects of the placement of man-made structures (e.g. aggregate extraction or a structure causing changes in water flows, ultimately changing the EUNIS level 2 habitat type).*

**Physical disturbance** is defined as a pressure that disturbs benthic biota but does not permanently change the habitat from one EUNIS level 2 habitat type to another EUNIS level 2 habitat type. With sufficient time, recovery can be expected without human intervention.

*Physical disturbance to physical loss can be regarded as a continuum, where the intensity of a physical disturbance may lead, in time, to a permanent change from one EUNIS level 2 habitat type to another and hence physical loss.*

### Pressure subtypes

*Human activities are introduced into the assessment process through four main pressure subtypes: abrasion, removal, deposition, and sealing.*

- *Abrasion: Fishing with mobile bottom-contacting gears.*
- *Removal: Aggregate extraction (removal of sediment for use elsewhere) and dredging (removal of sediment to clear/maintain an area).*
- *Deposition: Dredge disposal and fishing with mobile bottom-contacting gears.*
- *Sealing: Placement of permanent structures during a variety of activities (e.g. oil and gas extraction, renewable energy, harbours and coastal defence, tourism/recreation, pipelines and cables, wrecks, artificial reefs).*

Most important of these types regarding dredging and dredge disposal are removal and deposition, and in the advice it is written that:

#### Assessing adverse effects from removal

*Removal of the seabed can result from aggregate extraction, navigational dredging, scouring around structures, ship propellers, and other activities. The impacts of removal on the seabed can be assessed within the same benthic, physical disturbance model as the impacts of abrasion, provided that the footprint of substrate removal can be quantified and an estimate of the depletion of benthic biota within this footprint is available. The assessment process is suitable for the assessment of removal, and benthic physical disturbance models (e.g. the Population Dynamic Model, see Annex 4 in ICES, 2018b) are available that, in concept, can utilize the available pressure map. However, the mortality parameter describing removal within such models currently needs to be set at a precautionary high level due to a lack of parameter data. There are a large number of studies available that could be used in the estimation of the mortality parameter, but this analysis has not yet been carried out.*

*To create a pressure layer that serves D6C3, ICES advises that the quantification of removal is mapped spatially as the volume of substrate removed, per area, per time. Table A1.7 in Annex 1 provides information on possible data flows that meet these requirements for aggregate extraction removal.*

#### Assessing adverse effects from deposition

*Sediment deposition or the deposition of particulates on the seabed are the result of aggregate extraction, dredging of harbours and channels, scouring around structures, ship propellers, fishing with mobile bottom-contacting gears, and other activities which suspend sediments into the water. Dredge disposal will also result in the deposition of sediments, in addition to the potential sealing of the habitat. Quantification of the spatial extent of deposition requires modelling. However, parameterizing such models is computationally difficult and the approach is data hungry, i.e. relying on appropriate sediment data and hydrodynamic models. Nevertheless, the assessment process presented in this advice is capable of accommodating the output of such a model (volume of substrate deposited, per area, per time) should they become available.*

*To create a pressure layer that serves D6C3, ICES advises that the quantification of deposition is mapped spatially as the volume of sediments deposited, per area and per time.*