

Action project overview



WP 7 – Project policy interphase

WP1 – Bycatch

- High risk areas for by-catch of mammals and birds
- By-catch estimates
- Costs and effects of measures to reduce by-catch

WP2 – Impacts on seabed habitats

- Identification of areas with high positive response to restoration and spatial fishery measures
- Costs and effects of measures to improve seabed habitats

WP3 – Marine protected areas

- Method to assess effectiveness of MPAs
- Evaluation MPA contribution to achieving GES

WP4 – Input of nutrients

- Sources and trends
- Compatibility of nutrient reduction targets under different policies
- Evaluation of effects of existing (incl. planned) measures

WP5 – Conditions that influence achievement of GES

- How regional 'natural conditions', including climate change, will influence achievement of GES for relevant descriptors and criteria

Estimates of costs and effects of measures

List of measures, approaches for expert evaluation

WP6 – Sufficiency of measures: BAU scenarios, Joint cost-effectiveness of measures

WP2 ACTION: Impacts on the seabed and evaluation of measures

WP 2.1 Impacts on the seabed

- Consolidation of existing results (HELCOM BalticBOOST, TAPAS and SPICE)
- Identifying the pressures and activities that are causing the major impacts on a sub-basin scale

WP 2.2 Identification of effective measures to reduce impacts on the seafloor

- Evaluation of effectiveness of restoration project of coastal habitats
- Evaluation of the effect of spatial fishery management, e.g. closure of areas for fishing

Consolidating results



Estimating physical disturbance on seabed
BSEP 164



Baltic Sea Pressure/Impact Index (BSPI/BSII)
BSEP 155 + thematic report



Guidelines for defining thresholds for adverse effects on seabed habitats

<http://www.helcom.fi/helcom-at-work/projects/completed-projects/spice/results>

Lead: SYKE Finland

HELCOM Ministerial Declaration 2018

Seabed damage and disturbance

- **WE AGREE** (para 41) to do regional work on **developing threshold values for the adverse effects of anthropogenic physical disturbance and**, based on the best available scientific information in close coordination with other relevant fora, if needed to achieve GES, to **develop the necessary regionally coordinated quantitative targets for the reduction of physical disturbance caused by human activities and habitat loss;**

Marine Strategy Framework Directive: COM DEC (EU) 2017/848:

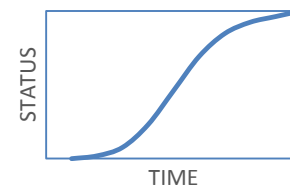
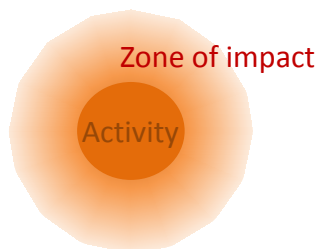
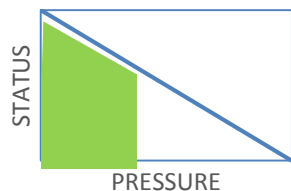
- ‘establish threshold values for the adverse effects of physical disturbance’ for ‘benthic broad habitat types or other habitat types’
- ‘establish the maximum allowable extent of those adverse effects as a proportion of the total natural extent of the habitat type’



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BalticBOOST: Physical disturbance

Synthesised results of more >100 studies, in depth case studies on local/regional scale. Three different aspects considered. Examples:



Impacts:

- **Fucus:** colonization inhibited at 10 g/m² per day sedimentation
- **Eelgrass:** >50% mortality at 0.2 cm burial per day
- **Benthic soft-bottom fauna:** 58-100% mortality at 10-40 cm burial

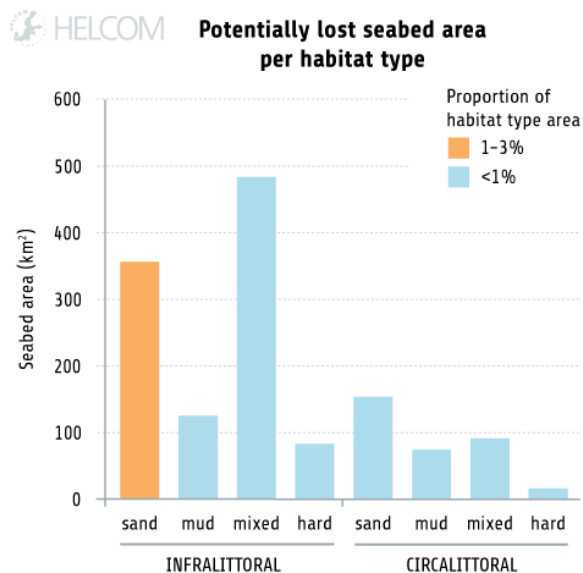
Extent of pressures:

- **Maintenance dredging**
Zoobenthos: 3 km
Fish: 4 km
- **Sand extraction**
Zoobenthos : 2 km
Vegetation: 3 km

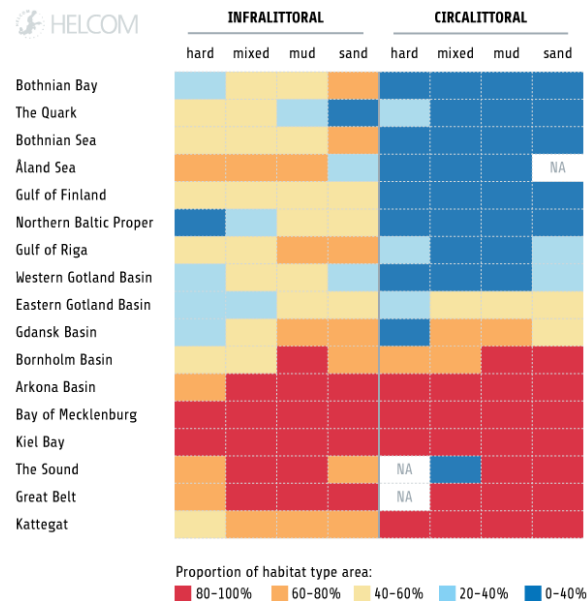
Recovery times:

- **Infralittoral hard bottom:**
Disposal, dredging, sand extraction: >5 years
- **Infralittoral sand bottom**
Sand extraction: >6 y at the site, 2 y at 0.5-1km.
- **Circalittoral mud bottom**
Disposal of dredged matter: 4 y at the site

TAPAS: Benthic application of BSPI



Estimate of area of broad benthic habitat types potentially lost due to human activities (up until 2016)



Estimate of the proportion (%) of the different broad benthic habitat types potentially disturbed due to human activities per sub-basin (2011-2016)

But how big area is adversely affected? e.g. not reaching GES?

SPICE: Thresholds for adverse affect

- Pressure-state studies can be used to define thresholds for impacts on biotopes from e.g. turbidity, sedimentation, abrasion
- Both the pressure intensity and extent of pressure has to be considered
- Threshold values should be defined at as detailed biotope level as needed, and needs to be set for the most sensitive biotopes in the area

Example:

Biotope 'Baltic photic muddy sediment characterized by macroscopic infaunal biotic structures' (HUB class AA.H3).

Good status is not achieved if suspended solids > 7 mg/L, and the distance is <0.6 km from dredging sites

= Adversely affected area (sub-GES) can be calculated

How big areas of a habitat/biotope can be adversely affected? 1%? 10%?

ACTION WP2.2 Restoration of coastal habitats

Cost-effectiveness and feasibility of :

- **Restoration** of habitats: eelgrass meadows, perennial brown macroalgae, blue mussel reefs, coastal wetlands, stony/boulder reefs
- Placing out **artificial substrates/reefs**
- **Farming and harvesting** organisms for nutrient removal
- **In situ measures combating hypoxia and eutrophication**
- **Biomanipulation** in the form of reduction fisheries
- **Restoring populations of predatory fish** e.g. by protection, regulations, restocking,

Identify coastal areas in highest need of restoration:

- Identify regionally threatened/disturbed habitats based on existing information (HELCOM red lists, HOLAS II, BSII etc)
- Suggest cost-effective restoration measures to these habitats/areas, and provide recommendations for specific measures to restore the disturbed habitats/systems.

Lead: SLU Aqua Sweden

ACTION WP 2.2 Spatial fishery measures

- A modelling platform (DISPLACE) to assess effectiveness of spatial measures affecting fisheries:
 - closing "by-catch high-risk areas" to certain fishing activities, e.g. high density areas for harbor porpoise, temporary closing of bird breeding areas
 - reaching good status for benthic species/communities by reducing/displacing fishing effort by x% e.g. overall, by habitat types, type of fishing activities
- Cost and effect of mitigating or displacing the fishing pressure including distributional effects, cost of the measures quantified for the marine fishing sectors.

Lead: DTU Aqua Denmark



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Example of application

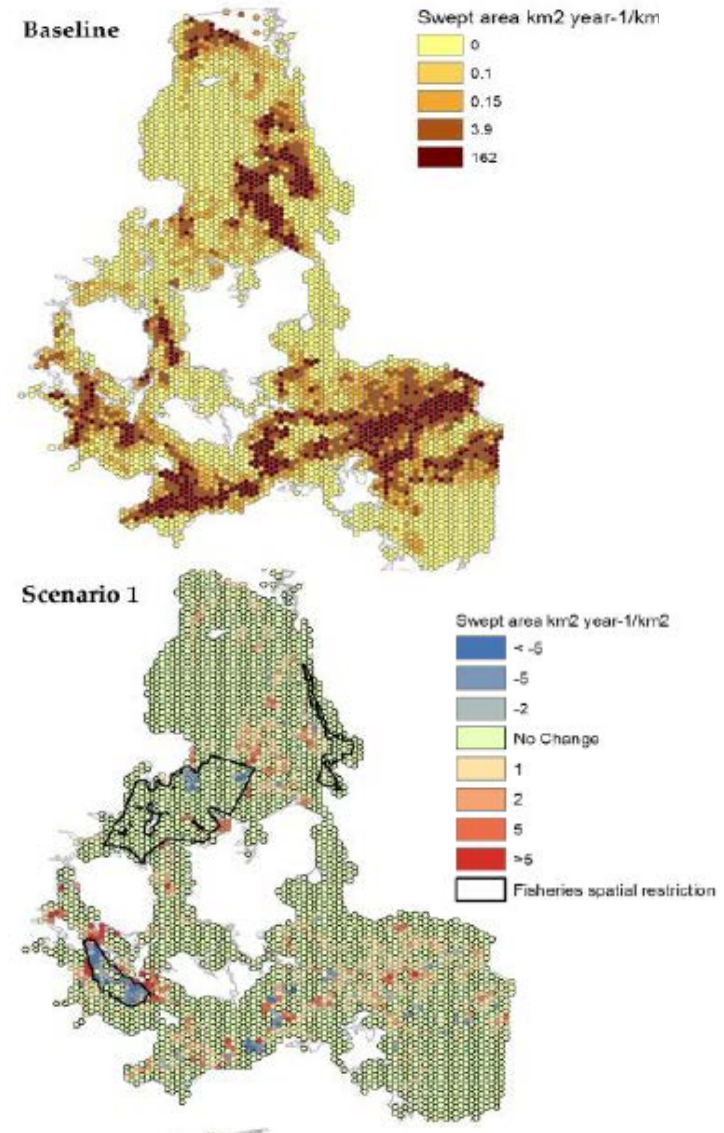
Baseline:
Current distribution of fishing effort

Scenario:
60% reduction of fishing in areas with sensitive habitats.

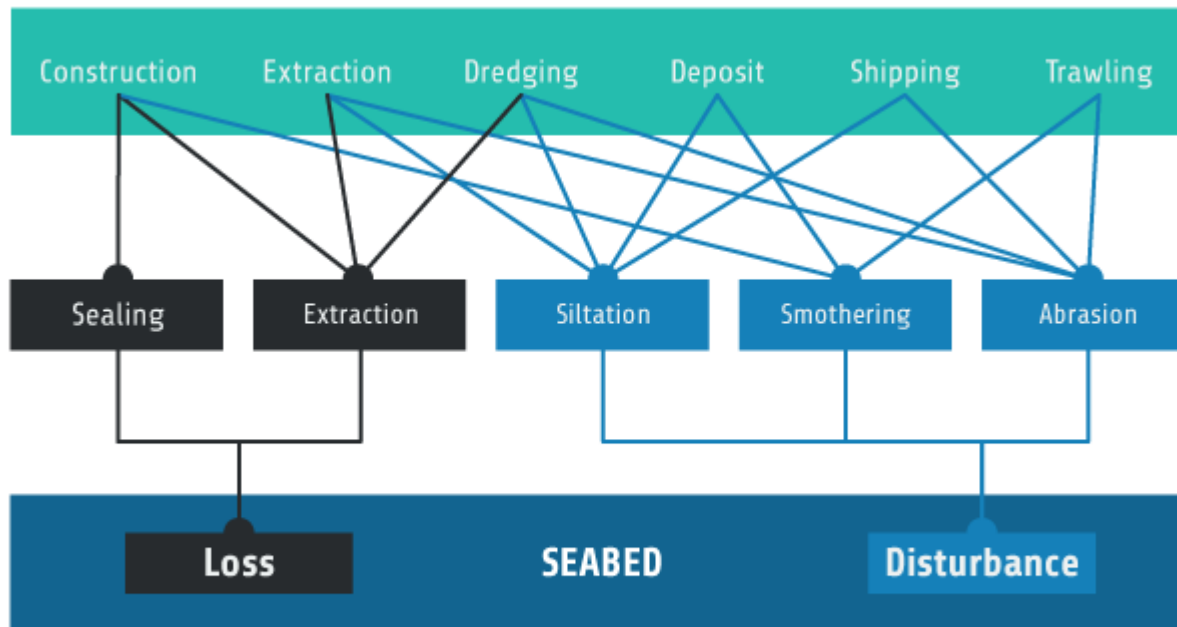
Results:

- 4% increase in fisheries profit
- 1% total increase in benthic fauna abundance
- 3% increase in benthic fauna abundance in sensitive habitats

ICES CM 2015/O: 05



Activities causing loss and disturbance to the seabed



Generalised overview of human activity types and the physical pressures they may exert on the seabed. The pressures are further grouped into those causing loss and disturbance of the seabed. Black lines link to potential physical loss of seabed habitats, and blue lines link to potential physical disturbance.

