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Background

The HELCOM ACTION project is co-funded by the EU and will be implemented in 2019-2020. The project was funded under the call for applications on "Marine Strategy Framework Directive - Second Cycle: Implementation of the new GES Decision and Programmes of Measures". The project has a general objective to contribute to the update of the Baltic Sea Action Plan and implementation of Programmes of Measures for Contracting Parties being EU members, and a specific objective to analyse the effectiveness and sufficiency of existing measures to reach good environmental status in the Baltic Sea. The focus of the ACTION project is on measures to reduce by-catch, impacts on the seabed and eutrophication, and the effectiveness of marine protected areas as measure to protect biodiversity. The topical focus was selected based on the identified priorities of the call for the Baltic Sea region. An evaluation of how natural conditions of the Baltic Sea is influencing the achievement of good environmental status is also part of the project.

The project held its kick-off meeting in February 2019. This document contains the inception report of the project. HELCOM-VASAB MSP WG is invited to take note of the information, in particular of the work carried out under work package 2 - 'Impacts on the seabed', 3 – 'effectiveness of MPA network' and 5 – 'analysis of reasons of not achieving GES'. The results could be taken into account for the development and implementation of MSP in the Baltic Sea region, bearing in mind that maritime spatial plans aim to contribute to achieve good environmental status. The HELCOM-VASAB MSP group will be kept informed on the further developments in the ACTION project.

The analyses of sufficiency of measures in the ACTION project will be coordinated with activities under the HELCOM SOM Platform as outlined in document 2-2.

Action requested

The Meeting is invited to take note of the information.



Baltic Marine Environment Protection Commission

Actions to evaluate and identify effective measures to reach GES in the Baltic Sea marine region (HELCOM ACTION)

Inception report

(1/1/2019 - 08/3/2019)



Co-funded by the
European Union

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General Information

Programme concerned: MARINE STRATEGY FRAMEWORK DIRECTIVE - SECOND CYCLE: IMPLEMENTATION OF THE NEW GES DECISION AND PROGRAMMES OF MEASURES

Reference number of the call for proposals: DG ENV/MSFD 2018 call

Title of the project: Actions to evaluate and identify effective measures to reach GES in the Baltic Sea marine region (HELCOM ACTION)

Grant agreement number: 110661/2018/794637/SUB/ENV.C2

Name of beneficiary of grant agreement: Baltic Marine Environment Commission - HELCOM

Official legal form: Intergovernmental Organisation

Official registration No.: Not applicable

Official address: Katajanokanlaituri 6B, 00160 Helsinki, Finland

Name and title of the Project Coordinator: Owen Rowe, Project Manager

Name of partners in the project and abbreviations used:

- 2.1 Finnish Environment Institute (SYKE)
- 2.2 Technical University of Denmark (DTU)
- 2.3 Aarhus University (AU)
- 2.4 Tallinn University of Technology (TTU)
- 2.5 Swedish Agency for Marine and Water Management (SwAM)
- 2.6 Swedish University of Agricultural Sciences (SLU)
- 2.7 University of Tartu, Estonia (UT)
- 2.8 Klaipėda University, Marine Research Institute (KU)

Sub-contractors: Baltic Nest Institute (BNI), Sweden; and AKTīVS, Latvia.

Start date and end date of the reporting period: 01/01/2019 – 08/03/2019

Start date and end date of the project: 01/01/2019 – 31/12/2020

Summary of the ACTION project

The ACTION project is designed to support EU Member States in updating and implementing MSFD Programme of Measures and to contribute to the update of the HELCOM Baltic Sea Action Plan by 2021 (see [HELCOM HOD 55-2018, Outcomes agenda item 3](#)). This takes place through evaluating the effectiveness of existing measures with regard to by-catch of mammals and birds, impacts on the seabed, marine protected areas, and eutrophication. The topics have been chosen based on the priorities of the funding call indicated for the Baltic Sea region as well as on the main pressures on the Baltic Sea ecosystem as identified in the 2018 HELCOM '[State of the Baltic Sea](#)' report. In addition, the project will analyse the natural conditions that influence achievement of GES in the Baltic Sea region, including impacts of projected changes in the climate.

The ACTION project will specifically address the following issues, via designated work packages (WPs):

- WP1 By-catch: identifying high-risk areas for by-catch of mammals and birds, evaluating technical measures to reduce by-catch of harbour porpoise, estimating the effect and cost of these mitigation measures.
- WP2 Impacts on the seabed: evaluating restoration measures in coastal areas and impacts of spatial regulation of offshore fisheries, including effects on benthic communities and costs of measures.
- WP3 Marine protected areas (MPAs): developing a method to assess management effectiveness of MPAs, assessing how MPAs contribute to achieving GES in the Baltic Sea.
- WP4 Input of nutrients: analysing sources and trends of nutrient input and compatibility of nutrient reduction targets under different policies, evaluating the combined effect of existing measures.
- WP5 Conditions that influence GES: analysing the conditions of the Baltic Sea that influence achievement of GES, including climate change.
- WP6 Sufficiency of measures: developing business-as-usual (BAU) scenarios for selected topics to identify potential gaps in measures to achieve GES, estimating cost-effectiveness of tentative new measures.
- WP7: Policy-project interphase: ensuring guidance from and timely contribution to the BSAP update process and the preparation of MSFD PoMs.

The project will furthermore develop business-as-usual (BAU) scenarios for selected topics to identify potential gaps in measures to achieve GES and estimate cost-effectiveness of tentative new measures to fill the gap towards GES. The project aims to base as many activities as possible on data driven analyses but will also make use of expert based evaluations to complement existing data and information derived from the project activities.

The supervision of the project takes place through the regular HELCOM working arrangements i.e. through guidance and review by HELCOM technical groups and expert groups during the course of the project. Through this arrangement the project results will also be directly available to national policy leads for the MSFD in the Baltic Sea region that can follow the project and ensure that it remains relevant for requirements of the MSFD.

The methodological framework developed in the project is expected to be applicable also in other marine regions and dissemination through MSFD CIS and other Regional Seas Convention, in particular OSPAR, will take place during the course of the project.

The inception report

The general methodology for tasks to be implemented in the project was outlined in the project application, though further details, in particular relating to the overview work package - WP6 'Sufficiency of measures', are detailed below (and in Annex 1).

Participants from all work packages in the ACTION project attended a physical kick-off meeting at the premises of the HELCOM Secretariat on 25-27 February, 2019. The project coordination team and participants from all project partners and all work packages planned the detailed next steps of the project.

This inception report is based on the tasks and responsibilities as outlined in the project application, with further specification of the methodology, as planned to date. Next steps and interim deadlines agreed between partners are also presented. Some interim deadlines have been slightly shifted compared to the application as seen necessary by the partners to allow sufficient time to carry out the planned analyses, and to ensure a good project-policy interaction.

The information is provided as tabular overviews below. N/A denoting tasks where methodology is not applicable, and the project partner name(s) in column WHO identifying those responsible for leading the task (bold) and those involved.

WP1 By-catch

By-catch of marine mammals (and birds) has been documented in many gillnet fisheries and is regarded as a major anthropogenic impact on marine mammals. High-risk areas for by-catch of marine mammals and birds in the south-western Baltic Sea (and other areas, pending data availability) will be defined. Effects and costs for the implementation of measures to reduce by-catch will be evaluated.

WP 1.1 Identification of high-risk areas

Identification of high-risk areas for by-catch and by-catch estimates can be used to evaluate the level of pressure on non-target populations from the fisheries industry and/or identify areas where monitoring of by-catch needs to be intensified. In this study the density data of harbour porpoises together with gillnet fishing effort data will be used to model areas of porpoise by-catch risk. The work will be divided into two main tasks:

- a) Data collection
- b) High-risk areas for by-catch

The model will be verified by the use of CCTV video footage on actual porpoise by-catches from commercial gillnet vessels. The high-risk maps will be developed for the south-western Baltic Sea. In other areas such as the eastern Baltic Sea the project will explore the possibility to create high-risk maps based on available fishing effort data and harbour porpoise abundance data. Total by-catch estimates of harbour porpoises will be provided as these will feed into the work in task 1.2. Density maps of sea birds (eider ducks, cormorants, and scoters) and seals (grey seal and harbour seal) are incomplete, however registrations of by-catches of these species are available from video footage. For these species by-catch estimates will be made as well as a gap analysis on the additional needs for data to identify high-risk by-catch areas.

WP 1.2 Evaluation of measures to reduce by-catch of harbour porpoises

There are few mitigation measures available to reduce by-catch of marine mammals, principally fisheries closures, alternative fishing gears and acoustic deterrents. For porpoises the main method to reduce by-catch is use of acoustic deterrent devices, so called pingers. The work will be divided into two main tasks:

- a) Evaluation of cost of measures
- b) Evaluation of the effect of measures

In this project the cost-effectiveness for implementing pingers and fisheries closures will be evaluated.

Information related to methodology is provided in the tables below.

WP 1.1 Identification of high-risk areas

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Data collection	DTU SLU HELCOM	- Data on fishing effort and porpoise density and bycatch data. Collection of bird and seal bycatch data.	- Collecting effort data (REM, AIS, Log book data (DCF), ICES database, SAMBAH data, porpoise satellite density data). - Source available data on species abundance and bycatch rates for birds and seals from applicable areas	1. DTU to collect AIS data from Sweden, Germany, Denmark, and Poland (Spring 2019). 2. SLU to contact Germany and Poland for other types of fishing effort data (Spring 2019). 3. SLU to collect data from SAMBAH (Spring 2019). 4. DTU to collect porpoise satellite density data (Spring 2019). 5. HELCOM to request access to ICES database (Spring 2019).	September 2019
b) High-risk areas for by-catch	DTU SLU SWaM	- High-risk maps for by-catch for mammals and birds, including underlying data and methodological description - By-catch estimates for birds and marine mammals	- Comparing AIS data with log book data. - Produce risk maps by overlaying porpoise data with fishing effort data. - Describe methodology and underlying data. - Calculate total bycatch estimates.	1. Using the available data, SLU to perform comparison of AIS and log book data (Summer 2019). 2. SLU and DTU to plan and produce risk maps, and discuss how the methodology can be applicable for the rest of the Baltic Sea (Summer 2019). 3. Join effort data and bycatch rate data to estimate total bycatch (Autumn 2019).	December 2019

WP 1.2 Evaluation of measures to reduce by-catch of harbour porpoises

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Evaluation of cost of measures	DTU SLU SWaM SYKE HELCOM	- Calculation of the cost for implementation of pingers. - Prediction of the performance of the test. - Calculation of the costs of pingers combined with fisheries areas closures.	- Calculate number of pingers needed, based on the net effort. - Calculation of the effect of pingers on the porpoise population. - Calculate the cost for fishermen to use pingers and cost for fishermen for closure of high-risk areas.	1. Consider areas where pingers or area closures are needed based on the high-risk maps (December 2019). 2. Based on the above, calculate the costs (December 2019). 3. Use the DISPLACE Model to predict consequences of fishing closures, in cooperation with WP2 (December 2019).	February 2020

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
b) Evaluation of the effect of measures	DTU SLU SWaM SYKE HELCOM	Estimation of the decrease in by-catch when implementing pingers, closed areas or a combination of the two measures.	Calculation of the effect of pingers on the porpoise population. Calculation of the effect of area closures (in cooperation with WP2).	1. Link information from WP2 and, WP1.1 and WP1.2(a) (January 2020). 2. Consider results collected (January 2020). 3. Evaluate the effect of measures (January 2020)	February 2020

WP2 Impacts on the seabed

Understanding the impacts of human activities on the seabed in the Baltic Sea region is important. Existing information on pressures and measures to reduce these impacts will be consolidated. Existing models and approaches will be used to identify the human activities for which measures are most urgently needed. The effectiveness of measures for improving the state of the seabed in both the open sea and coastal areas will also be evaluated.

WP 2.1 Identification of major pressures in Baltic Sea sub-basins

The recent knowledge developments resulting from previous HELCOM projects co-financed by the EU will be consolidated to provide a coherent overview of existing knowledge of impacts on seabed species and habitats due to human activities. The current knowledge will be presented at a workshop for regional experts, and further advanced to identify pressures and activities causing the major impacts on a sub-basin scale and developing the approaches related to integration of this work to the assessment of sufficiency of measures. The work will be divided into two main tasks:

- a) Consolidation of existing results
- b) HELCOM ACTION Workshop 2.1

The results of the workshop will serve as a basis for further work in the project to identify potential measures to reduce impacts on the seabed.

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

Results from restoration projects in the Baltic Sea region will be evaluated focusing on coastal habitats, e.g. coastal vegetated habitats, which are under extensive exploitation pressure in the Baltic Sea and at the same time are pivotal for production of ecosystem services. A modelled approach (DISPLACE model) will evaluate the effect of closure of areas for fishing, both in terms of impact on benthic habitats and impacts on catch/revenue/profit for fisheries. A workshop will be held to evaluate how far existing and tentative new measures can contribute to closing gaps towards GES with regards to the status of benthic species and habitats. The work will be divided into three main tasks:

- a) Restoration of coastal habitats
- b) Spatial fishery management measures
- c) HELCOM ACTION Workshop 2.2

The activity will also identify the areas where such measures would have the highest impact and provide information to the cost-effectiveness analysis.

Information related to methodology is provided in the tables below.

WP 2.1 Identification of major pressures in Baltic Sea sub-basins

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Consolidation of existing results	SYKE DTU HELCOM SWaM	- Summary report of the activities and pressures causing major impacts on benthic habitats in the Baltic Sea on a sub-basin scale	The overview is based on the results from previous HELCOM projects co-financed by the EU (BalticBOOST , TAPAS , SPICE), other EU-funded projects (DEVOTES , Benthis), and publications in EU and other marine areas (EEA, OSPAR BA6 , ICES advices). The information on status for benthic species and habitats as reported by EU Member States will be consolidated for further usage in the BAU scenarios in WP6.	1. Gather existing literature and reports 2. Summarize results on the activities and pressures causing major impacts on benthic habitats 3. Consolidate status and threshold values for benthic indicators and communicate to the Workshop 2.1 for subsequent use in WP2.2b and WP6. 4. Share report for the project partners and relevant groups.	May 2019
b) HELCOM ACTION Workshop 2.1	SYKE DTU HELCOM SWaM SLU	- Two-day workshop for project partners and national experts from the Contracting Parties for identification of major pressures in Baltic Sea sub-basins.	- Workshop to identify the pressures and activities that are causing the major impacts on a sub-basin scale and to provide guidance to the project on the approach for carrying out BAU scenarios under WP6.	1. In preparation of this exercise a template will be prepared that national experts will be requested to fill in advance of the workshop to justify the evaluation 2. Make available the results and workshop outcome to the MSFD CIS process to follow up the GES decision on descriptor 6 and components of descriptor 1 related to seabed habitats and of relevance for the Baltic Sea region.	May 2019 (tentative proposal for workshop 22-23 May - TBC)

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

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Restoration of coastal habitats	SLU DTU SYKE	- Evaluation report of the results from restoration projects in the Baltic Sea focusing on coastal habitats, including identification of cost-effective restoration measures and in which coastal areas they are of highest significance/need	- Review results from restoration projects in the Baltic Sea region to be evaluated focusing on coastal habitats, e.g. coastal vegetated habitats - Analysis of costs, effects and feasibility of restoration projects. - Identification of the areas where such measures would have the highest impact and provide information to the cost-effectiveness analysis to be carried out in WP 6	1. Gather results from restoration projects in the Baltic Sea region 2. Analyze costs, effects and feasibility of restorations 3. Identify areas for highest significance or need for cost-effective restoration measures.	October 2019
b) Spatial fishery management measures	DTU	- A modelling platform informed by existing monitoring systems for benchmarking the effectiveness of alternative management measures and spatial plans affecting fisheries - Report on the cost and effect of mitigating or displacing the fishing pressure in the Baltic Sea including distributional effects	- Integrate information on status and threshold values for benthic indicators from WP2.1a and Workshop 2.1. for the model - Update ecological-economic data by extending the existing application to the newest available data on benthos and fisheries - Running the DISPLACE model - Evaluate the scenarios for management measures and spatial plans	1. Gather information from WP2.1a and Workshop 2.1.b 2. Update data on benthos and fisheries for the ecological-economic data update	October 2019

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
c) HELCOM ACTION Workshop 2.2	SYKE DTU HELCOM SWaM SLU	Three-day workshop for project partners and national experts to evaluate how far existing and tentative new measures can contribute to closing gaps towards GES with regards to the status of benthic species and habitats.	- A workshop is be held to evaluate how far existing and tentative new measures can contribute to closing gaps towards GES with regards to the status of benthic species and habitats. Results from the activities related to restoration and fishery management measures will be complemented with information consolidated in WP2.1a.	1. In preparation for the workshop a 'score card' will be developed to estimate effectiveness of measures where quantitative estimates are not available.	February 2020

WP3 Marine protected areas (MPAs)

WP3 Assessment of effectiveness of MPA network

Currently the Baltic Sea MPA network covers approximately 18.9% of the Baltic Sea. The effectiveness of the existing MPA network (Natura 2000, HELCOM MPAs, and national MPAs designated under MSFD PoMs as relevant) as a measure for achieving GES for species and habitats in the Baltic Sea region will be assessed by current workpackage. This will be done by assessing management effectiveness (ME) of the MPA network through analysis of information on availability of management plans, implemented and enforced management measures. Assessment of ME will be linked with the HELCOM MPA Task Group and its application will be demonstrated at the network level and selected case studies.

The work will be divided into four main implementation stages:

- a) Development of method
- b) Collection of data and information
- c) Application of method
- d) HELCOM ACTION Workshop 3

The work will be presented and validated at a HELCOM two-day workshop with representatives from HELCOM countries and will also aim at formulating recommendations for achieving effective MPAs in the Baltic Sea area and the regular application of the ME assessment method.

Information related to methodology is provided in the tables below.

WP 3 WP3 Assessment of effectiveness of MPA network

TASK & DEADLINE	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Method development	KU UT AU HELCOM	Report on methodology for assessing management effectiveness of the Baltic Sea MPA network	- Adoption of main elements from IUCN management effectiveness evaluation (MEE) framework (Hockings et al., 2006) for both, single site and entire Baltic MPA network assessment; - Compilation of the list of criteria for main elements of MEE (based on suitability analysis); - Set-up of criteria scoring, weighting and integration rules (based on results from earlier applications and following judgements of local experts).	Review of management effectiveness framework applications for assessments of marine protected areas and compilation of the list of MPA management effectiveness evaluation criteria. Review of the latest information on the Baltic MPA network according to conservation features, network distribution, pressures, management and monitoring. Description of evaluation concept, main assessment stages, possible profiles for assessment output and presentation of results.	May 2019

TASK & DEADLINE	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
b) Collection of data and information	KU UT HELCOM		- List of protected habitat types and species, common to Habitat / Bird Directives, MSFD and HELCOM Red List defined; - List of potential pressures and linked activities compiled; - List of criteria compiled to sub-sample a feasible number of MPAs from the Baltic MPA network for further analysis. - Questionnaire on important pressures for protected habitat types / species developed for assessment of presence, implementation and enforcement of management measures in a context of important pressures.	Agreeing on information type to be exchanged with WP6 Development of questionnaire content and format. Presentation of the questionnaire to the Task group of MPA managers during the HELCOM State&Conservation meeting. Receiving information from questionnaires.	September 2019

TASK & DEADLINE	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
c) Application of method	KU UT AU HELCOM	Report on the assessment of effectiveness of the Baltic Sea MPA network.	- Analysis of questionnaire data on importance of pressures and their distribution across the conservation features; - Evaluation of MPA management effectiveness based on potential pressure reduction by implementation and enforcement of management measures; - Demonstration of full management effectiveness method application to the selected MPA's (case studies).	Delivery of information to WP6 Analysis of questionnaire data Data selection and demonstration of MEE for case studies Identification of gaps in data and method limitations in assessment of the Baltic MPA management effectiveness.	December 2019
d) HELCOM ACTION Workshop 3	KU UT AU HELCOM SYKE	Recommendations for improvement of MPA network effectiveness in reaching GES	- expert-based evaluation on contribution of the HELCOM MPA network to achieving GES; - workshop recommendations for effective MPAs and the regular application of the MEE; - the list of possible additional measures for how to improve the protection of species and habitats currently failing to reach GES.	Development of the questionnaire with WP6 for the HELCOM workshop; Compilation of workshop results.	February 2020

WP4 Input of nutrients

WP4 contributes to the implementation of the MSFD and nutrient reduction targets of the Baltic Sea Action Plan by developing and evaluating approaches to determine the effectiveness of measures to reduce nutrient loads to the Baltic Sea from its catchment and from remote sources. The focus of WP4 is on measures applied to external nutrient sources i.e. in the catchment, thus complementing the work carried out under WP5, which for example will consider nutrient processes in the coastal zone. The work package will facilitate intended closer collaboration between authorities involved in HELCOM work and River Basin Management Authorities within the region.

WP 4.1 Following up existing measures

Using data compiled in the HELCOM PLC database test cases will be identified, selecting flow-normalized data from two to four catchments per HELCOM country. These will be used to compare areas where measures have been particularly effective in reducing nutrient loads as well as those where significant efforts have been made to reduce nutrient inputs, but without apparent success. The underlying reasons for these results will be analysed, including consideration of the time for measures to reach maximum efficiency, possible climatic effects, changes in farming practices, etc. The project will assess if the present rate of nutrient load reduction is sufficient to meet the HELCOM BSAP targets by 2021 or, more likely, when targets would be met with the current rate. In addition, differences in the flow-normalized annual mean concentrations of discharges from direct point sources will be analysed in order to estimate the relative efficiency of the treatment of water discharges across the region. The work will be divided into three main tasks:

- a) Identify test cases
- b) Sufficiency of current measures to meet the BSAP obligations
- c) Contributions from point sources

WP 4.2 Compatibility of targets under different marine policies

WFD targets to achieve the HELCOM BSAP: National nutrient concentration targets at the limnic/marine limit from the EU Water Framework Directive (WFD) implementations will be used to estimate the nutrient load that could be expected from achievement of WFD Good Ecological Status. This assumes the same water discharge as observed during the Reference Period of the HELCOM nutrient reduction scheme (1997 – 2003) (HELCOM 2015). The task will inform countries whether their WFD targets are sufficient to achieve the HELCOM BSAP load reduction targets and if not, what concentration targets are appropriate or what changes to direct point source loads that are necessary. This will contribute to the harmonisation of WFD, BSAP and MSFD targets and may highlight a need for additional actions in the catchment to achieve GES at sea, beyond those required to achieve Good Ecological Status sensu WFD.

WP 4.3 Potential nutrient load reductions through existing measures

Nutrient load reductions from both implemented and planned measures will be estimated as a result of BSAP National Implementation Plans, WFD and MSFD PoMs, and other EU Directives. A questionnaire will be developed to collate available information regarding types of measures, sector-wise efforts, costs, and their geographical spread in the Baltic Sea catchment and estimated or measured effects on nutrient losses both at source and at the sea. A workshop will bridge between WFD implementation and the BSAP. This requires involvement of both national authorities and regional bodies responsible for the implementation of the WFD. The workshop will discuss the physical measures implemented under different policies, when they were

implemented, whether they remain in place with maintained function together with estimates of both their local effects and their effect at the Baltic Sea. Finally, the project will estimate the scale of measures required to achieve the BSAP goals and address cost-effectiveness issues. The work will be divided into three main tasks:

- a) Development and implementation of a questionnaire on Measures
- b) HELCOM ACTION Workshop 4.1
- c) Assessing the possibility to meet the BSAP targets

WP 4.4 Sharing experiences of Cycle 1 MSFD Programmes of Measures

HELCOM ACTION Workshop 4.2: Information on Programmes of Measures from the 1st Cycle of the MSFD will be collated in WP6 resulting in a list and categorisation of measures. Through this workshop, Contracting Parties will share their experience of implementing their eutrophication measures. The focus is on the MSFD PoMs, rather than WFD, and is expected therefore to mostly concentrate on sea-based measures. The two-day workshop will identify and spread best practice from the 1st round and identify further potential measures to improve the eutrophication status of the Baltic Sea.

Information related to methodology is provided in the tables below.

WP 4.1 Following up existing measures

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Identify test cases	SYKE SwAM BNI SLU TTU AU HELCOM	See 4.1b	Test cases based on PLC annual data will be suggested. Trends for all catchments exist, though national information on measures needed (to be able to explain effects). Contracting Parties select suitable catchments, PLC7 contacts used. Draft a report with examples. More examples can be collated later, also from countries not currently in the project.	BNI and SYKE to provide trend analyses for all catchments in PLC database. All partners to identify examples (two good, two bad) where measures have been successful / unsuccessful with the aim to explain the results in the final report. PLC7 contacts to contribute. BNI to start drafting report.	April 2019
b) Sufficiency of current measures to meet the BSAP obligations	SwAM BNI SLU TTU AU HELCOM	Report describing and explaining more and less successful approaches to reduce nutrient loads and the need for additional measures for achieving the BSAP objectives.	The test cases from activity 4.1a, as well as the source apportionment produced in PLC6, will be utilized. A more detailed analysis will be done for the test cases and for the whole Baltic Sea. -Forecast on when to achieve MAI (magnitude of the current gap and rate of progress). - Whole Baltic source apportionment (sector to basin) from PLC6/7 will be delivered to WP6.	BNI to perform analyses. Report finalized. [Possible outcome here could be the downscaled BSAP catchment targets required for the later workshop]	June 2019
c) Contributions from point sources	SYKE SLU TTU AU HELCOM	Report describing the variation in efficiency of nutrient treatment from point sources, discussing variability across the region and between industrial sectors and potential for improved, harmonised treatment requirements across the region Improved quality control of point source data in the HELCOM PLC database	Point sources in PLC database, where source and load have been reported, case studies indicating the variability in discharge concentrations Reduction potentials will be estimated for municipal point sources, per country where there is incomplete implementation of HELCOM Recommendation 28E-5. Incomplete point source data to be sought in order to make the data sets better. Both direct and indirect point sources considered. Information on time lags can be given to WP5. Uncertainty information on the data sets will be collected and estimated, reported to WP6.	SYKE to collect information on point sources from PLC data base, while trying to fill out gaps in the current knowledge. Reduction potentials outlined for each country and suggestions for harmonizing discharge licensing if appropriate.	July 2019

WP 4.2 Compatibility of targets under different marine policies

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) WFD targets to achieve HELCOM BSAP	TTU SYKE SwAM SLU AU HELCOM	Recommendations on ways to improve compatibility of targets under various legislative instruments. Report on the comparison of riverine load reduction from the 1997-2003 values if WFD nutrient targets were achieved in rivers.	Data for comparing WFD and BSAP targets will be requested from Contracting Parties (supported by EcoStat data where needed). Normalized river flow data will be used. WFD nutrient concentration targets for rivers will be gathered. Riverine loads using normalized flow and WFD targets will be calculated. The potentially achieved reduction in comparison to the 1997-2003 riverine load is found. The load reduction based on WFD targets will be compared with the agreed reduction targets. Uncertainty in input numbers to be considered, in particular when uncertainty will accumulate through several steps. An indication on whether the WFD measures are insufficient to reach GES, and additional measures thus needed, will be forwarded to WP6.	Data gathering on normalized flow, 1997-2003 riverine load and WFD targets (March-May 2019). Load reductions calculated. Conclusions on the SoM to reach GES collated and reported.	July 2019

WP 4.3 Potential nutrient load reductions through existing measures

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Development and implementation of a questionnaire on Measures	HELCOM SYKE SwAM SLU TTU AU	Results of a questionnaire describing national commitments and collating information from regional and local authorities describing implemented, physical measures	The questionnaire will be drafted using the experiences from PLC6 project. When possible, information will be prefilled in the questionnaire, so the countries only have to update any new information. The draft questionnaire will be sent to AGRI 7-2019 and PRESSURE 10-2019 for comments and to help engage the proper contacts to answer the questionnaire. Final draft to be sent to PRESSURE three weeks ahead of their meeting. EMEP data to be used for atmospheric input. Supplementary information: WWT: Reporting on HELCOM recommendations will be utilized for finding out the proportion of the treatment plants that comply with the HELCOM requirements. Scattered dwellings: Reporting on HELCOM recommendations will be utilized, results of the BASE will be used for additional information for Russia.	Questionnaire drafted in cooperation with PLC7. Questionnaire presented to AGRI and PRESSURE for possible updates and final decision to accept it.	March 2019
b) HELCOM ACTION Workshop 4.1	HELCOM SYKE SwAM SLU TTU AU	Results of a questionnaire describing national commitments and collating information from regional and local authorities describing implemented, physical measures	The workshop will be organized in late September 2019. WS to be divided into two main parts: policy and measures. The answers to the questionnaire will be discussed to validate the results. WFD gaps in implementation. If possible co-arranged with river basin commissions/PRESSURE, wide invitation to stakeholders.	HELCOM to finalise the workshop agenda and the description of discussions and deliverables. List of invitees finalized. Dates (suggested 16-18 Sep 2019) to be confirmed. Venue proposed (Warsaw - TBC). Invitation sent.	October 2019

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
c) Assessing the possibility to meet the BSAP targets	HELCOM SYKE SwAM SLU TTU AU	Report describing work to date and the potential for additional measures to achieve the BSAP goals. Input to WP6.	Strong linkage to WP4.1b and c. The results of the questionnaire, workshop, literature studies and models will be used to assess the possibility to meet the BSAP targets. Time lags from measures to actual load reductions to status improvements taken into consideration. WWT Directive, compare requirements to HELCOM recommendations. WWTP vs HELCOM recommendations – how many comply? EMEP report on atmospheric input used. Pressure from shipping to be included in analysis.	Review the outcome of WP4.1b and c. Collect all other needed information, from inside and outside the project. Report drafted.	December 2019

WP 4.4 Sharing experiences of Cycle 1 MSFD Programmes of Measures

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) HELCOM ACTION Workshop 4.2	HELCOM SYKE SwAM SLU TTU AU	See 4.3c (that draft report to be updated with information from this task)	Workshop to be organized in January 2020 in potential cooperation with the "HELCOM group to draft regional principles and risk assessment framework for management of internal nutrient reserves (ad hoc Group MINUTS)". In the workshop, each country will present their MSFD Cycle 1 programme of measures (PoM) related to eutrophication in order to improve regional harmonization and fill gaps. Possible future measures (reefs, habitat restoration, coastal ecosystem restoration etc.) to be discussed and evaluated in order for the Contracting Parties to develop their Cycle 2 measures.	WP6 to deliver information on current measures implemented by the Contracting Parties under the MSFD. HELCOM to consider agenda and venue for the meeting. List of invitees prepared. Invitations sent. Conclusions from WS fed into the report drafted under WP4.3c.	February 2020

WP5 Conditions that influence GES

WP 5 Analysis of reasons for not achieving GES

This WP will analyze the current knowledge on natural conditions that influence the recovery of the Baltic Sea towards GES and address how projected future changes in climate will affect the effectiveness of measures taken to improve the Baltic Sea environmental state. Moreover, we will collect information on current examples where HELCOM Contracting Parties who are also EU member states request exceptions due to natural conditions or processes. We will analyze this information to elucidate common features and those aspects most widely perceived as causing the failure to meet GES. A review of the scientific literature and recent project outcomes, including model scenario outputs, to identify gaps or delays in achieving GES due to natural conditions and possible effects of climatic changes will also be carried out. More detailed analyses (descriptors, criteria) will be provided for selected topics. The work will be divided into two main tasks:

- a) Basis and reasons for exceptions related to not reaching GES (i.e. defining 'best practices')
- b) Review and analyses

These analyses will result in a report, which will be provided to HELCOM groups such as HELCOM State & Conservation for a technical review, before it is finalized.

Information related to methodology is provided in the tables below.

WP 5 Analysis of reasons for not achieving GES

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
<u>a)</u> Best practices	TTU AU HELCOM	Summary report and table with example where member states ask for exceptions.	Collecting member state reports from EU database and gathering the reported exceptions for not achieving GES, and their justifications. Giving an overview on exceptions and justifications and explanation for conditions or processes that hinder achievement of GES. Define best practices for justification of exceptions.	Analysis of the reports (e.g. look at Danish, Swedish and German reports) and compiling a table on exceptions and given justifications (March-April 2019). To validate the found exceptions and their justifications by national experts.	June 2019
<u>b)</u> Review and analyses WP 5 will deliver reports on the three subjects; biodiversity, eutrophication and hazardous substances.	TTU AU HELCOM	Preliminary report A Preliminary report based on literature review will be compiled as the first input to the work in WP6.	Review of published literature and assessments on time-lags between the changes in pressures and the impact in the environmental state. Topics include eutrophication and selected aspects of biodiversity and hazardous substances.	To search for different indicators from literature (including HELCOM reports and scientific publications) and prepare the information for WP6 on different time-scales (March-June 2019).	June 2019

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
	TTU AU HELCOM	Final report This report will address the subject in more detail and focus on issues identified as the key obstacles for reaching GES.	<u>Biodiversity</u> The examples will be selected where natural conditions hinder achievement of GES (e.g. ringed seals, etc). Review will highlight the scientific arguments and if available the estimated timelags or potential maximum levels which could be achieved. <u>Eutrophication</u> We will focus on two issues; 1) Effects of climate change on precipitation, stratification and oxygen conditions. Here we will review the literature and analyze existing model outputs (RCO and IOW ERGOM), if possible. 2) Accumulation of organic matter and the associated nutrients, in particular nitrogen. The Baltic Sea has received increased nutrient inputs for many years. The accumulated pools of organic matter and nutrients in the water and sediment can supply significant amounts of available nutrients for phytoplankton growth and hence keep the Baltic Sea in a eutrophic state. We will address this issue and seek to quantify the effect based on literature studies and, if possible, model simulations, and analyze existing data. <u>Hazardous substances</u> We will select the hazardous substances there are identified as major problems according to the HOLAS II report. The scientific literature and information from HELCOM groups/networks will be reviewed to explain the reasons not achieving GES. For instance, Hg is most probably a global issue where significant new inputs continue from atmospheric deposition (rainfall influence); and TBT although banned is still in the sediments.	To search for different indicators from literature (including HELCOM reports and scientific publications) and prepare the information for WP6 on different time-scales (March-June 2019). Definition of aspects that will be covered under biodiversity and hazardous substances topics (March-May 2019).	mid-2020

WP6 Sufficiency of measures

This work package will act as an overview, to which all other WPs supply required supporting information for the development of effectiveness of measures and business as usual approaches. WP6 contributes to the update of the HELCOM Baltic Sea Action Plan (BSAP) and the implementation of the EU MSFD by developing a regionally coordinated approach to assess the sufficiency of existing measures, the need for new measures, and the cost-effectiveness of the new measures. The analyses will be limited to the topics addressed by WPs 1-5. The WP6 method is applicable at the regional level to support the update of the HELCOM BSAP and could also be used at smaller spatial scales (i.e. sub-basins or the national level) to support the update of MSFD PoMs as required by 2022. In addition, the developed approach is agile in that the effectiveness and costs of measures can be estimated using models, data and expert elicitation. WP6 draws upon work carried out in WPs 1-5 and supports a coherent formulation of the outputs to be usable for the analyses of business-as-usual (BAU) scenarios and cost-effectiveness of measures.

A detailed methodology and approach have been devised in advance of the kick-off meeting and agreed by the project partners at the kick-off event. The methodology structure and overview were a central part of the discussion and is considered as critical since it will inform on the needs and function of WP6, and will determine the interaction with other WPs in the project. The general methodology and approach to be taken is provided here and the more detailed methodology and approach is provided in Annex 1.

WP 6.1 Regional business-as-usual (BAU) scenarios

The approach for the BAU scenarios in the Baltic Sea, based on the proposal developed in the HELCOM coordinated SPICE project, co-financed by the EU, will be operationalised. The scenarios will be used to analyse the gap between BAU and Good Environmental Status (GES). Scenarios will be developed for aspects covered by WP1-5. The scenarios will make use of data-driven models and a semi-quantitative, probability-based expert survey. A common method framework for the BAU and cost-effectiveness analysis will be developed and a linkage framework, linking between human activities, pressures and state will be utilised. The approach used will be supported by information on existing measures, and evaluations of the effectiveness of those measures, and projections of future human activities and pressures will also be incorporated. In addition, a gap analysis to address the remaining reduction in pressures to reach GES, and the role of natural conditions, will also be carried out. The work will be divided into seven main tasks:

- a) Approach
- b) Linkage framework
- c) List of existing measures and their status
- d) Effectiveness of existing measures
- e) Projections of human activities or pressures
- f) Gap analysis
- g) HELCOM ACTION Workshop 6

WP 6.2 Potential new measures and their cost-effectiveness

For those topics where a need for new measures is found and quantified between the BAU scenarios and GES under task 6.1, potential new measures will be identified by building on expertise in other work packages. Cost-effectiveness of these measures will be analysed. This work will be based on the estimated costs and effectiveness of potential measures. All the evaluations will include the aspect of uncertainty by using probability scales. Given natural conditions, certainty of the evaluation and effectiveness of the potential measures, sets of measures will be formulated. The work will be divided into five main tasks:

- a) Identification of potential new measures (incl. existing but non-implemented ones)
- b) Effectiveness of new measures
- c) Joint effects of new measures
- d) Cost estimation
- e) Finding optimal sets of new measures

Information related to methodology is provided in the tables below and in more detail in Annex 1.

WP 6.1 Regional business-as-usual (BAU) scenarios

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Approach	SYKE HELCOM TTU SWaM AKTiVS	Description of the approach for analysing the sufficiency of measures (SOM).	Building on previous work, e.g. in the HELCOM SPICE project and the work of the project group, a framework for the SOM analysis will be developed. Describes the overall and more detailed approach.	Finalizing the description of the approach.	March 2019
b) Linkage framework	SYKE TTU HELCOM AKTiVS	Linkages between measures, human activities and pressures in the Baltic Sea region.	Builds on previous work in the TAPAS and ODEMM projects. Measures will be linked to activities and pressures, and main pathways between activities and pressures will be identified and, if possible, quantified based on literature, project results and expert evaluation.	Links between activities and pressures. Information on relative contribution to pressures from different activities. Possible prioritization and quantification of activity-pressure linkages.	December 2019
c) List of existing measures and their status	HELCOM SYKE AKTiVS	Compilation of information on existing and planned measures having an impact on the Baltic Sea.	Measures in existing policies will be identified and categorized based on their implementation status, type, activity (or pressure or state component), time lags and the object of their effect, using information from the HELCOM explorer and recommendations, EU MSFD PoMs, EU WFD and other EU policies. Individual measures are grouped based on the categorization and with the aim to avoid overly specific definitions.	Initial list of categorized and grouped measures.	December 2019
d) Effectiveness of existing measures	SYKE HELCOM AU DTU KU SLU TTU UT	Information on the effectiveness of measures.	Estimation of how much measures or measure groups reduce each pressure, or, in case of restoration measures, affect state components. The information on effects of measures can be quantitative, semi-quantitative or qualitative. Data sources include results from WPs 1-4, output from other projects, literature and models, EU MSFD PoMs and expert evaluation. In order to support the analyses, the effectiveness data are transformed to a common format.	Compiling information on the effects from various sources.	December 2019

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
e) Projections of human activities or pressures	HELCOM SYKE AKTiiVS	Projected future development of selected activities and pressures.	Information will be collected on development trends of activities and pressures in the BAU timeframe. The analysis will be limited to the predominant activities and pressures. The projected change will influence the previous step (i.e. reduction of pressures). Data will be based on results in WP5, literature, sectorial future outlook reports. Expert evaluation will be used to include the information in the framework.	Selecting activities and pressures to be covered, going through potential sources on projected development of human activities and pressures in the future.	December 2019
f) Gap analysis	HELCOM SYKE TTU DTU AKTiiVS	Report with BAU scenarios and gap-analysis for achieving GES for selected topics, eutrophication, impacts on the seabed and by-catch.	Pressures will be linked to state components based on information from the BSII, core indicator reports and expert input. The quantitative effect of selected pressures on state will be estimated from literature and expert inputs. BAU status will be developed and compared to GES to identify whether there is a gap and new measures are needed.	Linking pressures to state components, developing the approach for assessing the effect of reduced pressures on state.	April 2020
g) HELCOM ACTION Workshop 6	HELCOM SYKE AU DTU KU SLU TTU UT SWaM AKTiiVS	Outcome of the workshop.	A HELCOM ACTION workshop will be arranged to discuss the outcome of the gap analysis and arrive at a common understanding on how results should be interpreted to support the identification of new measures.	Drafting background documents for the workshop, practical arrangements.	March 2020

WP 6.2 Potential new measures and their cost-effectiveness

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
a) Identification of potential new measures	HELCOM SYKE AU DTU KU SLU TTU UT	List of potential new measures for eutrophication, impacts on seabed, by-catch and marine protected area	Potential new measures will be identified based on results from WPs 1-4 and other information sources.	Initial list of potential new measures.	May 2020
b) Effectiveness of new measures	SYKE HELCOM SWaM UT DTU KU SLU AKTiVS	Information on the effectiveness of new measures.	Assessment of the effects of measures will build on the framework developed in WP6.1. Information will be collected from WPs 1-4 and other projects, and complemented and validated with expert input when needed. The assessment of the effects of new measures will follow the approach used to assess the effects of existing measures.	Building on WP6.1, compiling information on the effects from various sources and validation by experts.	September 2020
c) Joint effects of new measures	SYKE HELCOM TTU SWaM	Information on the joint effects of measures.	Additive, antagonistic and synergistic effects will be considered, using the linkage framework developed in WP6.1 and following Saikkonen et al. Joint effects will take place in two cases: (1) in reduction of pressures and (2) in improving state of the ecosystem components. In the first case, these will be evaluated on the basis of overlap of measures and their causal relationships. Antagonistic effects are expected in most joint effects as over-optimistic effects will be avoided. In the second case, reduction of different types of pressures will improve the state and joint effects may also be synergistic or additive. The type of joint effect is evaluated on the basis of change mechanism, i.e. identifying antagonistic, synergistic or additive mechanisms how pressure reductions are contributing to state improvements. Data sources include literature, project outputs and expert evaluation and the results are expected to be semi-quantitative.	Identifying joint effects of measures, developing approaches to account for them.	September 2020

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE
d) Cost estimation	SYKE HELCOM SWaM DTU AKTiiVS	Information on the costs of measures. Method description to run regional cost-effectiveness analyses over multiple pressure and state targets.	Guidelines will be developed for estimating costs of new (or not yet implemented) measures and information collected from literature, sectorial organizations and selected experts by using broad categories. Uncertainty and cross-region variability in the costs will be addressed. A method description on how to assess the cost-effectiveness of new measures using the BAU-framework from WP 6.1 as a basis will be developed.	Guidelines for estimating the costs of measures. Description on how to assess the cost-effectiveness of new measures using the BAU-approach as a basis.	September 2020
e) Finding optimal sets of new measures	SYKE HELCOM AU DTU KU SLU TTU UT SWaM AKTiiVS	Report on cost-effectiveness of potential new measures to bridge the gap to GES.	The cost-effectiveness approach will be applied for new measures and the optimal sets of new measures will be defined based on this analysis. The results of the analyses will be compiled into a report which also discusses confidence of the analysis and aims to advice the HELCOM process of updating the regional measures of the Baltic Sea Action Plan.	Running the cost-effectiveness analysis on new measures. Defining the sets of optimal measures based on the results of the cost-effectiveness analysis. Writing, publishing and sharing the report.	December 2020

WP7 Policy-project interphase

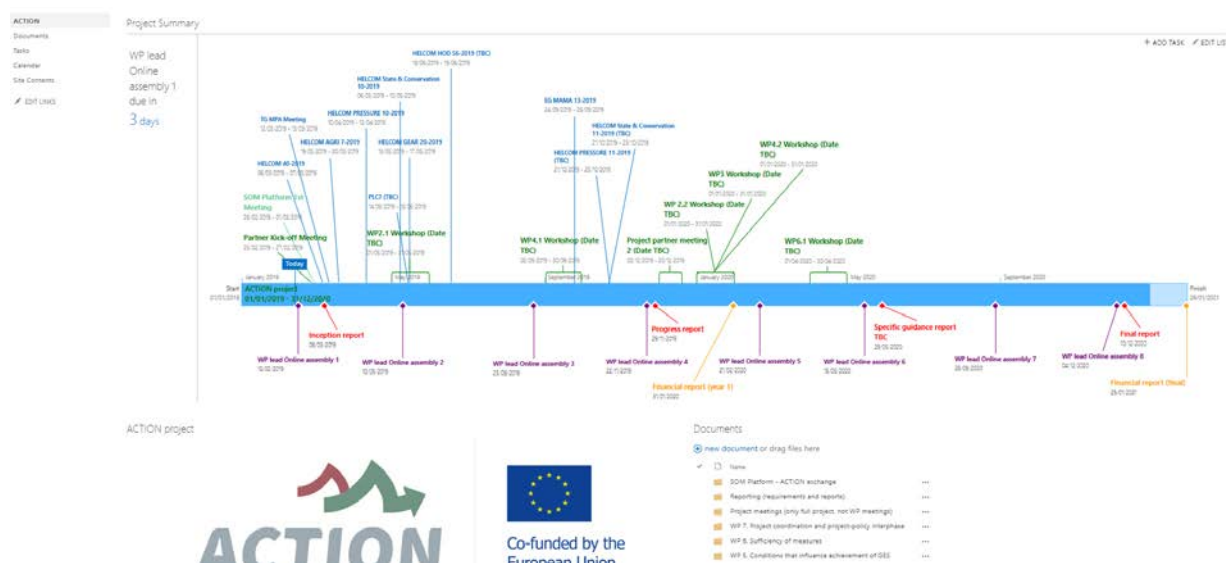
WP 7 Project coordination and project-policy interphase

WP7 concerns the internal project coordination as well as establishes a project-policy interphase which is deemed as required for successful implementation and future use of project results. A dedicated technical project coordinator will ensure that these required interactions are fulfilled. General project coordination and in particular the interaction between WP1-5 and WP6 are considered critical, as is the transfer of information to HELCOM expert and Working Groups. The work will be divided into four main tasks:

- Project coordination
- Project-policy interphase
- Financial coordination
- Joint partner meetings

WP7 will also identify suitable opportunities for communicating results to other Regional Seas Conventions, other projects financed under this call, and the MSFD CIS process (Expected use of results). Travel resources for such interactions are also allocated to the respective WP. The professional and other assigned staff at the HELCOM secretariat will contribute to WP7 and also follow the work of the respective WP.

To facilitate this process and the general information flow within the project a workspace, designated to the [ACTION project](#) has been established in the HELCOM Meeting Portal (screen shot below) in advance of the partner kick-off meeting. This provides a space for storage and exchange of information within the project and will assist in maintaining relevant deadlines within the project, and for reporting to meetings of relevant HELCOM groups and other external organisations (e.g. EU or OSPAR Working Groups).



Screenshot of HELCOM Meeting Portal site designated to the ACTION project.

A project logo (see below) has been developed and the logo with relevant templates has been provided to project partners. A [project web page](#) has also been placed on the HELCOM website list of projects to briefly introduce the overall project.



ACTION project logo.



Co-funded by the
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Information related to methodology is provided in the tables below.

WP 7 Project coordination and project-policy interphase

TASK	WHO	DELIVERABLE	METHODOLOGY	NEXT STEP	DEADLINE*
a) Project coordination	HELCOM	- Project well coordinated. - In particular interaction with WP6. - Technical reports to DG-ENV.	- Dedicated workspace and timeline, regularly updated. - Regular online meetings with WP leads (circa every 3 months). - Regular communication. - Templates for technical reporting to funding agency (EU-DG ENV) - Cooperative work with partners to prepare reports.	- Update workspace with meeting dates when available. - Support planning for WP2.1 workshop. - Preparation for WP lead Online Assembly 2. - Regular, same approach as above throughout project. - Template development for reports.	Throughout - December 2020. - Progress report 29/11/2019 (Month 12). - Specific Guidance report 29/05/2020 (Month 18). - Final report 10/12/2020 (60 days from Month 24).
b) Project-policy interphase	HELCOM	- Interaction and information exchange with HELCOM groups and external organizations. - Support for Contracting Parties and Baltic Sea Action Plan update processes.	- INF and CMNT documents to relevant HELCOM expert and working groups. - Data requests to HELCOM groups when needed. - INF documents to relevant external organizations/processes (e.g. OSPAR and EU groups). - Follow document meeting deadlines (i.e. 1 or 3 weeks in advance) where possible.	- Reporting to relevant HELCOM meetings (spring meetings, 2019) – this inception report. - Following new meeting dates as they become available (update to workspace). - Develop specific requests and documents for relevant meetings (multiple occasions) as required.	Throughout - December 2020 (initial deadlines in workspace).
c) Financial coordination	HELCOM	- Overall project financial reporting. - Support and follow up of partners for financial reporting.	- Template and deadlines established for reporting. - Close contact with identified financial contacts at partner organizations.	- Delivery of templates and approach to partners. - Follow up with identified partner contacts.	Throughout - December 2020. - Financial report – year 1 31/01/2020. - Financial report – final 29/01/2021.
d) Attendance of joint project meetings	All partners	- Kick-off meeting (DONE). - Project partner meeting. - Online meetings as needed.	- Kick-off meeting successful. - Physical project meeting to bring together all technical experts. - Joint meeting and parallel WP sessions. - Technical planning, and broader project-policy interphase plan.	- Initiate planning in early autumn (latest) 2019 for next project meeting. - Follow up via regular WP lead Online Assembly – expand as needed. - Consider need/possibility for further physical or online meetings of whole project as needed, especially in autumn 2020.	February 2019 and December 2019

*NOTE: in DEADLINE column the dates given are those established in the project to ensure timely reporting. Those given by Month are the requirements for EU DG ENV.

Annex 1

Annex 1, appended below, provides the document supplied by overview work package (WP6) to the ACTION project partners prior to the project kick-off meeting. The document provides an overview and explanation of the methodology proposed and highlighted areas for other WPs to consider in advance of the kick-off meeting (i.e. how to integrate all WPs into WP6).



ACTION and sufficiency of measures analysis

Baltic Sea Action Plan update

The Baltic Sea Action Plan was decided to be updated at the latest by 2021 through the 2018 HELCOM [Ministerial Declaration](#). The aim of the update of the BSAP is to adjust actions based on the newest scientific knowledge so that HELCOM's strategic goals and ecological objectives can be reached and relevant marine and water targets of 2030 Agenda for Sustainable Development can be met in the Baltic Sea.

HOD 54-2018 approved a [strategic plan for the BSAP update](#) and HOD-55-2018 agreed on a [detailed work plan](#) for the work. According to the strategic plan for the BSAP update, an analysis of sufficiency of measures should be carried out to support the selection of new and strengthened HELCOM actions. The sufficiency of measures analysis entails assessing whether the implementation of existing measures is sufficient to achieve the good environmental status, taking into account the projected future changes in human activities.

Sufficiency of measures analysis in ACTION

The main responsibility for SOM analysis lies within the recently established HELCOM Platform on sufficiency of measures (SOM Platform), but the ACTION project has an important role in the analysis. ACTION WP6 develops an overall approach for the SOM analysis in WP6.1, to be used for all environmental topics included in the analyses. The approach for the SOM analysis will be implemented by the SOM Platform and the ACTION project. ACTION WP6 also develops an approach for assessing the cost-effectiveness of new measures (incl. non-implemented existing ones) in WP6.2. The ACTION project will also contribute to proposals on potential new HELCOM actions. The approaches developed in the ACTION project and the results of individual work packages will thus support the HELCOM BSAP update.

In terms of topics, the HELCOM ACTION project will consider measures related to by-catch of mammals and birds, impacts on the seafloor, Marine Protected Areas (MPAs) as a conservation and protection measure, and eutrophication. The SOM Platform will focus its work on complementary topics to the ACTION project, i.e. hazardous substances, non-indigenous species, marine litter, underwater noise, and biodiversity aspects not covered by the ACTION project.

Input to sufficiency of measures analysis in WP6 from other WPs

WP6 draws upon work carried out in WPs 1-5. WPs 1-4 will, in particular, contribute to information on effects of measures on activities/pressure/state, depending on the measure, for WP6.1, and on potential new measures and their feasibility for WP6.2. WP5 is expected to contribute with information on possible time lags in the effect of measures on environmental state for WP6.1. In addition, ACTION partners are expected to contribute to expert based validation and evaluation that will be needed in a number of steps of the SOM analyses.

The remaining document includes a detailed proposal for the SOM approach, developed by ACTION WP6, that has been submitted to the HELCOM SOM Platform kick-off meeting. More detailed description of each information need can be found in the document.

Proposal for the SOM approach

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1. Overall approach

The aim of the analysis of sufficiency of measures (SOM) is to assess whether existing policies are sufficient to achieve good environmental status (GES) in the Baltic Sea. It relies on estimating the status of the marine environment at some specific future point in time, given measures in existing policies, their implementation status, natural time lags, and possible development of human activities/pressures over time. This is called the ‘business-as-usual (BAU) status’ (Figure 1). If the analysis indicates that GES is not achieved, then existing measures are not sufficient and additional measures are needed.

The development of the BAU status entails describing how the state of the marine environment would change over time due to 1) the implementation of existing policies and measures therein impacting the marine environment and 2) possible changes in human activities/pressures. There are several important considerations and decisions that need to be made in order to operationalize the framework. These are listed at the end of the document under Discussion points.

SOM analysis includes the following components:

- information on existing measures and their level of implementation, and possible time lags in their effect (Steps 1-2),
- identifying main pathways for pressures based on links between activities and pressures (Step 3),
- estimating the effect of measures on pressures and state (Step 4),
- projections of the development of human activities/pressures (Step 5),
- estimation of the changes in the state of the marine environment due to changes in pressures (Step 6),
- using the information above to assess the projected status of the marine environment (BAU status) by a specific point in time (Step 7),
- comparison of the BAU status to GES and evaluating how far we are from reaching GES, i.e. the sufficiency of measures (Step 7).

The steps are described in detail in Section 2.

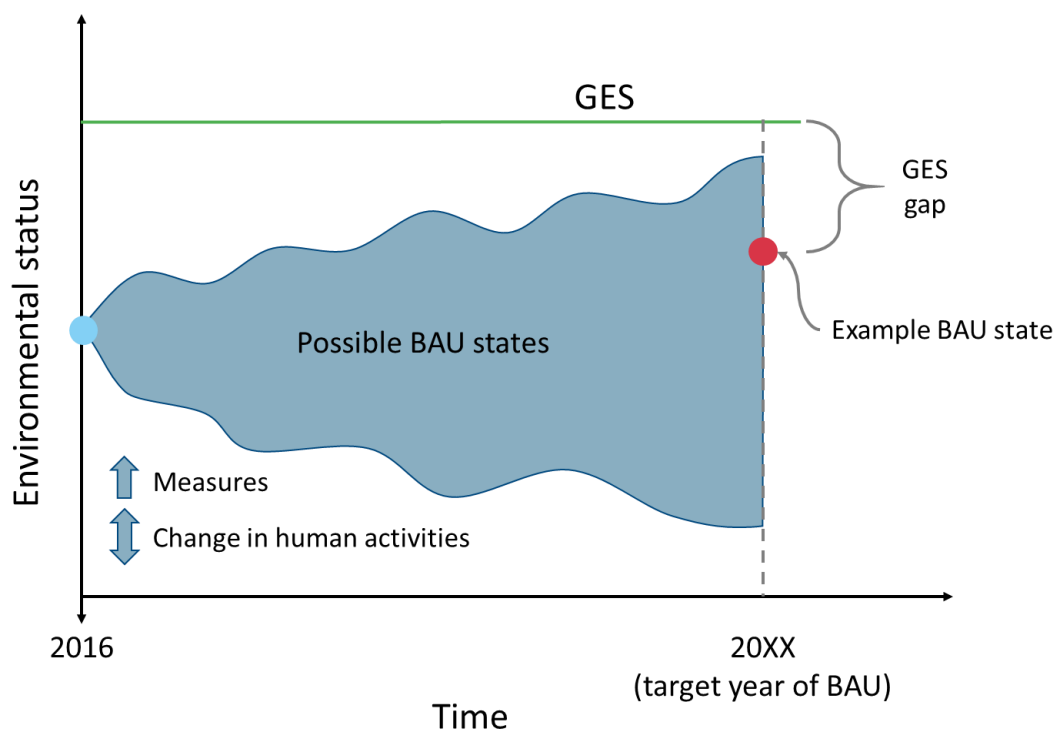


Figure 1. Illustration on the use of the BAU in the gap analysis. Source HELCOM (2018a).

Time frame

The time frame of the BAU should be consistent with the relevant target years of the HELCOM BSAP and the EU MSFD. The time frame should stretch beyond 2020/2021 to allow for more complete impact of existing policies and measures, but it should not stretch too far into future to avoid uncertainties in changes in the climate and policies.

The meeting of the HELCOM expert network on economic and social analyses (Item 4.2 in the [Outcome of EN ESA 2-2018](#)) suggested to follow the MSFD cycles in deciding the time frame, i.e. having 2027 or 2033 as the end year. Another consideration is that HELCOM has agreed to align its work with the UN Sustainable Development Goals (SDGs), most of which have the target year of 2030.

In the choice of the time frame, it is important to account for other analytical and technical issues, such as time lags in the effect of measures on environmental status and increasing uncertainty as the time frame is lengthened. This aspect is further reflected in Section 2 Detailed approach, under Step 2.

Several alternative BAU scenarios could also be developed with different end years.

Although a specific end year is chosen for the BAU, the agreed target years for implementing existing measures should be acknowledged. This could affect assumptions made in the analysis on when the ongoing/planned measures will be implemented.

Existing policies and measures

Measures that are included in the BAU status (existing measures) need to be clearly defined. For all existing relevant policies (e.g. current BSAP, MSFD, WFD, EU Biodiversity Strategy 2020), implemented, on-going (or partially implemented) and planned measures¹ are proposed to be included in the BAU, as suggested by EN ESA 2-2018 (Item 4.3 in the [Outcome of EN ESA 2-2018](#)). Thus, it would be assumed that all measures in existing policy frameworks are fully implemented in the time frame of the BAU, independent of their current implementation status, and their effect on reducing pressures would be realized fully in the time frame of the BAU.

It is also possible to conduct an alternative SOM analysis with a different set of measures, i.e. including only measures that have been fully implemented as of now. The difference between the BAU status with implemented measures and the BAU status with all measures in existing policies would show how the implementation of ongoing and planned measures affects the state of the sea.

It also needs to be decided what types of measures are considered in the analysis, i.e. whether to exclude measures that e.g. increase awareness, information and knowledge but have no direct impact on pressures and the state of the sea. Alternatively, their effectiveness can be estimated as low and uncertainty high.

Environmental themes to cover

It is proposed that the SOM analysis will be carried out for the same environmental themes as in the State of the Baltic Sea report (Figure 2). For some themes a descriptor level evaluation could be appropriate, e.g. to compare the BAU state with the integrated status. For biodiversity, the analyses could be done by ecosystem component, groups of species (e.g. coastal fish) or in some cases by species (e.g. grey seal). For a majority of topics, the status threshold values are proposed to be used as the basis for the analyses. For eutrophication,

¹ Note that the term *existing measures* covers implemented, partially implemented/ongoing and planned/not yet implemented measures in existing policies.

the analyses could rely on pressure targets as agreed in HELCOM. A reflection on this is provided under Section 2, Step 2.

For some topics there are no agreed GES threshold values or quantitative pressures targets (e.g. marine litter, underwater noise) in HELCOM, and thus proper gap analysis is not possible. For these topics, it is still possible to assess how much the existing measures will contribute to reducing a certain aspect of the pressure, e.g. the amount of litter on beaches.

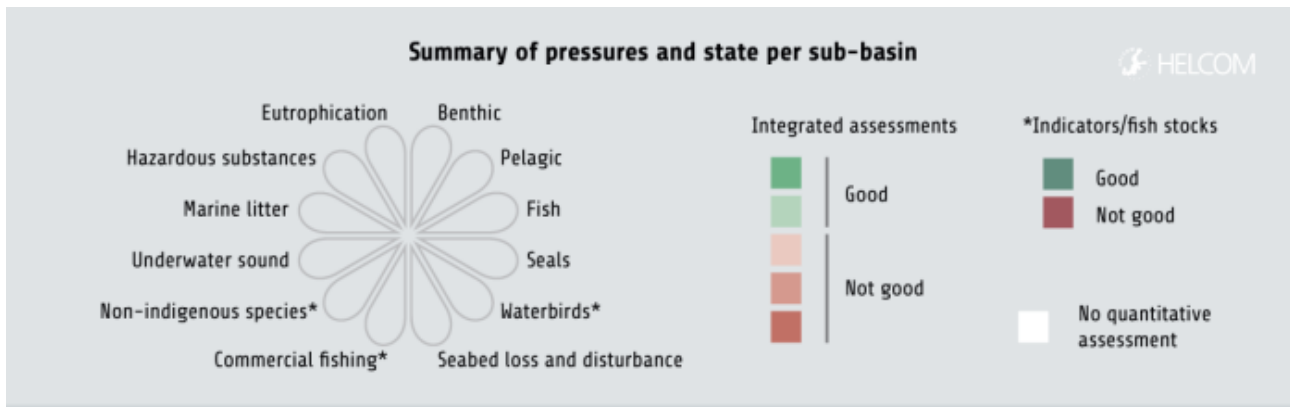


Figure 2. Proposed state components of the SOM analysis.

Geographical scale of the analysis

The geographical scale of the SOM analysis is aimed at supporting decisions from a regional Baltic Sea perspective. Still, the SOM analysis could be carried out at a smaller scale if found relevant, e.g. by sub-basins or a set of sub-basins. The scale would not need to be identical across environmental themes/pressures and sub-basin scale analyses could be considered for themes/pressures with high spatial difference.

2. Detailed approach

The proposed approach to carry out the SOM analysis is described in seven steps and follows the overall structure presented above and in Figure 3. The main objective is to assess the sufficiency of measures to achieve GES. This is done by estimating how much existing measures will reduce anthropogenic pressures in the time frame of the BAU, the consequent change in each of the state components presented in Figure 2, and whether this will be sufficient to achieve GES for these components.

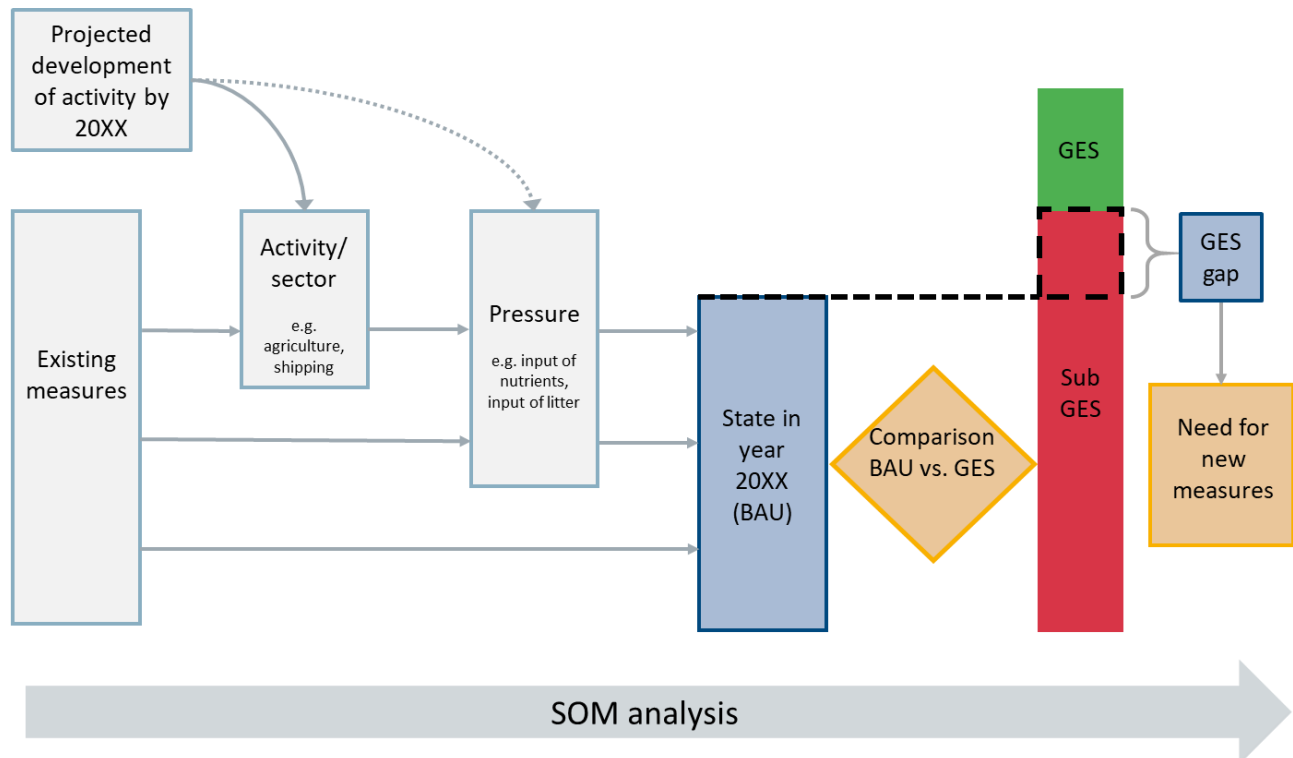


Figure 3. Structure of the SOM analysis: Linking measures with activities, pressures or state components; predicted changes in activities and pressures; comparison of the BAU state with GES; and estimation of the need for new measures.

Step 1. Existing measures

This section gives detailed information on SOM components related to existing measures and their level of implementation.

1a. Identify measures under existing policies (i.e. existing measures) to assess their effect on the marine environment. This includes global conventions, EU directives and regulations, regional HELCOM actions and national measures.

1b. Categorize measures into common groups based on, for example, the general type of the measure (e.g. legal, technical, monitoring, knowledge and awareness), and the key type of the measure (KTM) (as in the EU WFD). The categorization will allow for simplifying the analysis (i.e. by aggregating similar type of measures) and linking them with activities and/or pressures (or in case of restoration measures, to state).

A majority of measures are linked with human activities, but some may be linked to pressures (e.g. long-range transboundary pollution) and a few are directly linked to state components (e.g. restoration, restocking) (Figure 3).

- If a measure is linked to an activity, i.e. the activity is restricted or changed, then one can follow the linkage framework and estimate the consequent reduction of pressures (Steps 3-4).
- If a measure is linked to a pressure or a state component (restoration measures), then the effect in Step 4 is directly estimated.

1c. Assess the implementation status of the measure, i.e. whether the measure 1) has been implemented, 2) has been partially implemented or implementation is ongoing, or 3) is planned to be implemented. The implementation status of the measures may differ by countries, which needs to be taken into account. The BSAP implementation status has been assessed already in previous HELCOM processes, but some other measures (e.g. national MSFD measures) may require such an assessment on the basis of EU Member State reports. This step informs especially Step 2.

Information needed	Data sources	Main contribution
List of measures	HELCOM Explorer HELCOM Recommendations EU MSFD Programmes of measures EU WFD Other EU policies/directives as agreed	ACTION project/secretariat
Implementation status (implemented, partially implemented/ongoing, planned)	As above + EU reports on implementation of PoMs	ACTION project/secretariat, complemented as needed by CPs
Type of measure (e.g. technical, monitoring, knowledge and awareness...)	As above	Initial sorting by secretariat/ACTION project, validation by SOM Platform
Whether a measure has an effect on activity, pressure or state	As above	Initial sorting by secretariat/ACTION project, validation by SOM Platform

Step 2. Estimating time lags for measure effects

Even fully implemented measures do not always have an immediate effect on the state due to time lags which may be caused by environment's slow recovery after the pressure (e.g. benthic communities after trawling) or the slow decay of the pressure from the environment (e.g. contaminants in sediment). Based on Step 1c, one can estimate the time lags for fully implemented, partially implemented or planned measures.

- If a measure is fully implemented, then one needs to estimate whether there could be any time lag in its effect on environmental status. If no time lag is estimated to remain, then the effects of the measure should be visible in the current state of the marine environment and the measure can be left out of the further SOM analyses. Otherwise, the measure is included and one needs to estimate whether the effects will be seen by the BAU end year (Figure 1).
- If a measure is only partially implemented or planned to be implemented, then one needs to make an assumption that the full implementation will take place by the BAU end year (cf. the urge by Ministerial Declaration 2018 to implement the BSAP). Additionally, one needs to estimate whether the measure has time to affect the state before the BAU end year.
- The issue with time lags could also be resolved by focusing on pressure targets instead of state threshold values, especially for eutrophication where it is already known that the GES will not be reached with the time frames for the BAU discussed so far. The effect of measures on pressures could be assumed to be realized fully in the time frame of the BAU, while reaching GES could happen later than by the BAU end year.

Information needed	Data sources	Main contribution
Data on time lags of effect of measures on state	Literature	SOM synopses ² , ACTION project

Step 3. Identifying main pathways for pressures using activity-pressure-linkages

Assessing the effects of measures means describing how they affect pressures or state either directly or via activities. Thus, the links between activities and pressures need to be identified and quantified. Information on the linkages between activities and pressures is available, for instance, in the activity-pressure matrix of the [TAPAS project](#), and in more detail similar matrices of the [DEVOTES project](#). These can be used as a starting point to identify the main pathways. A key issue is that the links should be (semi)quantitative and, hence, allow for assessing the relative contribution of the activities to the pressure. This is important for assessing the proportion of the pressure reduction attributable to each activity and for identifying potential new measures.

Information needed	Data sources	Main contribution
Links between activities and pressures	Project results (e.g. HELCOM TAPAS linkage matrices , DEVOTES linkage matrices)	ACTION project. Anticipated that existing results can be used
Information on relative contribution to pressures from different activities	HELCOM reports, literature	SOM synopses ³ , ACTION project
Possible prioritization of activity-pressure linkages	Literature	ACTION project/secretariat
	Expert evaluation/validation	Working Groups, Expert Groups, ACTION project, SOM Platform

Step 4. Estimation of effects of measures

When the main pathways between activities and pressures have been identified, one will estimate how much measures will jointly reduce each pressure. In the case of restoration measures, this step will entail estimating how much measures will affect the state components. The information on effects of measures can be quantitative, semi-quantitative (e.g. percentage intervals) or qualitative (e.g. no effect, small improvement, large improvement). Several data sources and expert evaluation can be used to estimate these pressure reductions. Expert evaluation can also be used to survey for possible hidden/neglected pressures that were not identified in Step 3. The relative effects of measures on pressures and state are proposed to be defined as probability distributions that describe the probability of different reduction outcomes (e.g. using percentages (%)). The total effect of measures includes the effect of reduction in pressures on state and the direct effect on state.

Information needed	Data sources	Main contribution
Data on effects of measures	National data	Reporting by countries
	Research projects (e.g. BONUS, BLUE2) Scientific literature, studies and models	SOM synopses ⁴ , ACTION project

^{2,3,4} SOM synopses refer to compilation of information to be carried through the SOM Platform with a Lead country approach.

	EU MSFD Programmes of measures Sources listed in the SPICE project deliverable on Business-as-usual scenarios EC DG ENV databases (e.g. ARCADIS 2012)	
	Expert evaluation/validation	Working Groups, Expert Groups, ACTION project, SOM Platform

Step 5. Projected development of human activities/pressures

The other component affecting the BAU state in addition to existing measures is the possible (external) change in activities and pressures due to changes in human behaviour in the time frame of the BAU. This may counteract the effect of existing measures if activities or pressures increase.

This step is proposed to be run as an additional scenario on top of the effectiveness of existing measures analysis. The analysis will be limited to the predominant activities and pressures. As this component would be considered as external to the rest of the framework, the BAU status could be developed by assuming 1) no change and 2) the most likely change in predominant activities/pressures. This would enable assessing how the future change in activities/pressures affects the BAU status.

At minimum, qualitative assessment describing the trend (increasing, decreasing, no change) in the activity/pressure should be made, but quantitative information should be used when available from existing studies. For developing the BAU, the information should be converted into numerical values, e.g. 10% increase in the activity, using expert evaluation when needed. If little information is available, it would be possible to assume something about the change in activities and see how the BAU status changes.

Information needed	Data sources	Main contribution
Information on the future development of activities (qualitative/quantitative)	Literature, sectorial future outlook reports Project outputs (e.g. BONUS) National data (e.g. on EU MSFD Initial Assessments, and MSPD)	secretariat/ACTION/SOM synopses
Converting the information into numerical values	Expert evaluation	Working Groups, Expert Groups, ACTION project, SOM Platform

Step 6. Linking reduced pressures with state components

Assessing the BAU status requires estimating the effect of changes in pressures on state. This entails two steps.

6a. Selecting pressures for state components: In order to estimate the effect of reduced pressures for a state component, one needs to select the relevant pressures, i.e. those having a major impact on the state. Information of this can be collected from four partly complementary sources: Baltic Sea Impact Index (BSII) (i.e. ranking the most impactful pressures per state component), sensitivity of state components to pressures (i.e. ranking pressures having highest potential effect on species), core indicator reports (descriptive information) and validation by expert input from HELCOM Working Groups and Expert Groups. Some of these sources can also be used to estimate the relative contributions of the pressures for the given state

component which may inform step 6b. Output from this is a matrix of pressure-state linkages and relative contributions of pressures affecting the state (the latter to inform step 6b).

6b. The effects of selected pressures on the state components: There is no method available to establish quantitative relationship between all pressures and state components. From the state point of view, one can show that there is a gap to GES, but there are no quantitative estimates how much pressure(s) the GES gap implies. The effects of pressures on state components are estimated from scientific literature, reports, published models and expert input (HELCOM Working Groups, Expert Groups and networks, ACTION project, SOM Platform). This step will also explore and test the use of pressure state response curves to estimate the impacts of pressures on the state components (Figure 4).

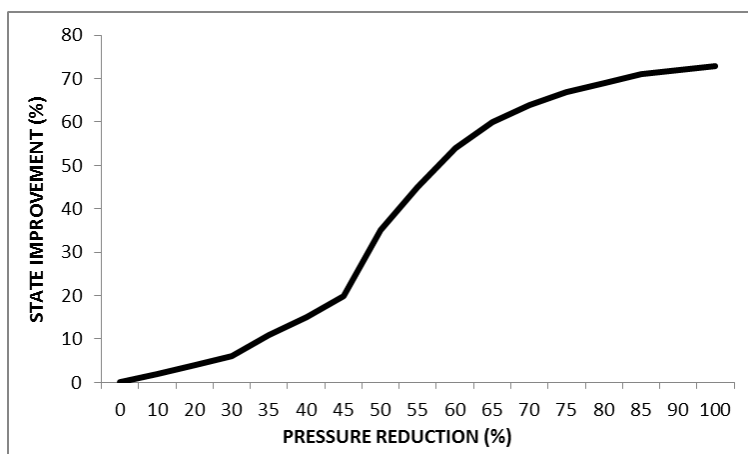


Figure 4. Conceptual pressure-state response curve. The curve illustrates the potential of pressure reduction to improve the state (expressed as the gap to GES).

Information needed	Data sources	Main contribution
Spatial data on pressures and impacts	HELCOM map and data service	Secretariat
Spatial data on state components	HELCOM map and data service	Secretariat
Information for selecting relevant pressures	Baltic Sea Impact Index (BSII) Core indicator reports	Secretariat/ACTION project
Responses of indicators/state components to changes in pressures	Previous research projects and reports Scientific literature Existing models	SOM synopses ⁵
	Expert evaluation/validation	Working Groups, Expert Groups, ACTION project, SOM Platform

Step 7. Comparison of BAU and GES and assessing sufficiency of measures

When the BAU status has been developed, it will be compared with GES to identify whether there is a gap and new measures are needed. The total effect of measures on state is calculated as the reduction of the GES gap based on the previous steps. In addition, the Step 5 results (projected development in human activities/pressures) will also affect the outcome of the SOM analysis. If a pressure is predicted to increase and no measures are in place to control that, the gap to GES may increase.

⁵ SOM synopses refer to compilation of information to be carried through the SOM Platform with a Lead country approach.

Discussion points

Overall

- What is the time frame of the analysis (end year of BAU)? Options:
 - o 2027
 - o 2030
 - o 2033
- What is the geographical scale of the analysis?
 - o Sub-basin level or entire Baltic Sea level?
 - o Same or different across environmental themes?

State components and descriptors

- Will we use the same themes as in the State of the Baltic Sea (HOLAS II) report (see Figure 2)?
- Which targets and levels will be used when comparing BAU and GES?
 - o Pressure targets vs. state threshold values
 - o Descriptor (integrated status) vs. indicator level

Measures

- Which measures are included in BAU? Options:
 - o 1) include all decided measures (implemented, ongoing and planned) in BAU;
 - o 2) include only implemented measures in BAU (accounting the possible time lag in their effect);
 - o 3) run the analysis for both alternatives 1) and 2)
- What types of measures should be included? Options:
 - o 1) only technical measures that have a concrete effect on activities/pressures/state;
 - o 2) all measures, including controlling measures and informational measures
- How to deal with the fact that most of the measures will have different implementation status in various countries?
- How to deal with time lags (of the effect of measures on state)? Will we assume that the effect of measures on pressures is realized fully by the BAU end year, and that the effect of pressure changes on state can take place later if there are time lags?

Activity-pressure links

- Linkage frameworks to identify the pathways
 - o How to define the main activities related to each measure?
 - o How to define the main pressures related to each activity
 - o Are there existing linkage frameworks for Baltic Sea that quantify/rank the linkages between measure-activity-pressure?

Pressure-state links

- How to estimate the impact of reduced pressures on the state?
- Is it possible to define new curves/functions/distributions to (combined) pressure-state responses based on available spatial data.

Projected development of activities/pressures

- Will we develop BAU using two alternatives on projected development of human activities/pressures: 1) no change, 2) most likely change?

References

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HELCOM 2016. TAPAS Theme 1 Deliverable: Baltic Sea pressure and impact indices (BSPI/BSII) Available at: <http://www.helcom.fi/Documents/HELCOM%20at%20work/Projects/Completed%20projects/TAPAS/TAPAS%20Theme%201%20Deliverable.pdf> (see Annex 6 for the TAPAS linkage framework between activities and pressures)