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<b>Document title</b>	Preliminary results of the SOM analysis
<b>Code</b>	3-8
<b>Category</b>	CMNT
<b>Agenda Item</b>	3 – Implementation and update of the Baltic Sea Action Plan
<b>Submission date</b>	20.10.2020
<b>Submitted by</b>	Secretariat

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## Background

Sufficiency of measures (SOM) analysis, carried out by the HELCOM ACTION project and the HELCOM SOM Platform, supports the update of the BSAP by assessing what kind of improvements in environmental state and pressures can be achieved with existing measures by 2030-2035, and whether these are sufficient to achieve good environmental status (GES) in the Baltic Sea. The methodology for the SOM analysis has been developed by the ACTION project with guidance from the SOM Platform, and endorsed by GEAR 22-2020 ([Outcome](#), para 4.21).

The format of the presentation of the results has been developed based on discussions and comments from, in particular, the SOM Platform, Expert Network on Economic and Social Analyses ([Outcome of EN ESA 9-2020](#), Agenda Item 4), ACTION project and HELCOM Working Groups. The first results of the SOM analysis were submitted to the thematic HELCOM BSAP UP workshops organized in August and September 2020 to provide supporting background information for the evaluation of proposed new actions.

This document presents the partially updated results of the SOM analysis for fish (provided in a [separate file](#)). In addition to the main result, i.e. the probability of achieving GES/specific state improvements with existing measures, the documents present findings on which pressures contribute to state components, what are the reductions in pressures from existing measures, how effective are measure types in reducing pressures, and which activities contribute to pressures.

In addition, this document lists updates and revisions to the reporting and presentation of the SOM results based on review of the results and input gathered from SOM topic teams, BSAP UP workshops and SOM Platform. It also describes the schedule of SOM work in the autumn 2020. The final SOM model estimation results should be available in October after input from HELCOM groups and networks, and reports will be prepared by the end of 2020.

This document also briefly introduces the validation of SOM data by the Working Groups and Expert Networks that took place in September 2020. The Fish Group was responsible for validating the input data for fish.

## Action requested

The Meeting is invited to:

- consider the preliminary results of the analysis of sufficiency of measures for fish;
- consider and comment the proposed presentation format of results for fish, based on the number of contributing experts;
- take note of the preliminary results of the analysis of sufficiency of measures for all topics; and
- take note of the validation of input data to the SOM analysis.

## Results of the SOM analysis

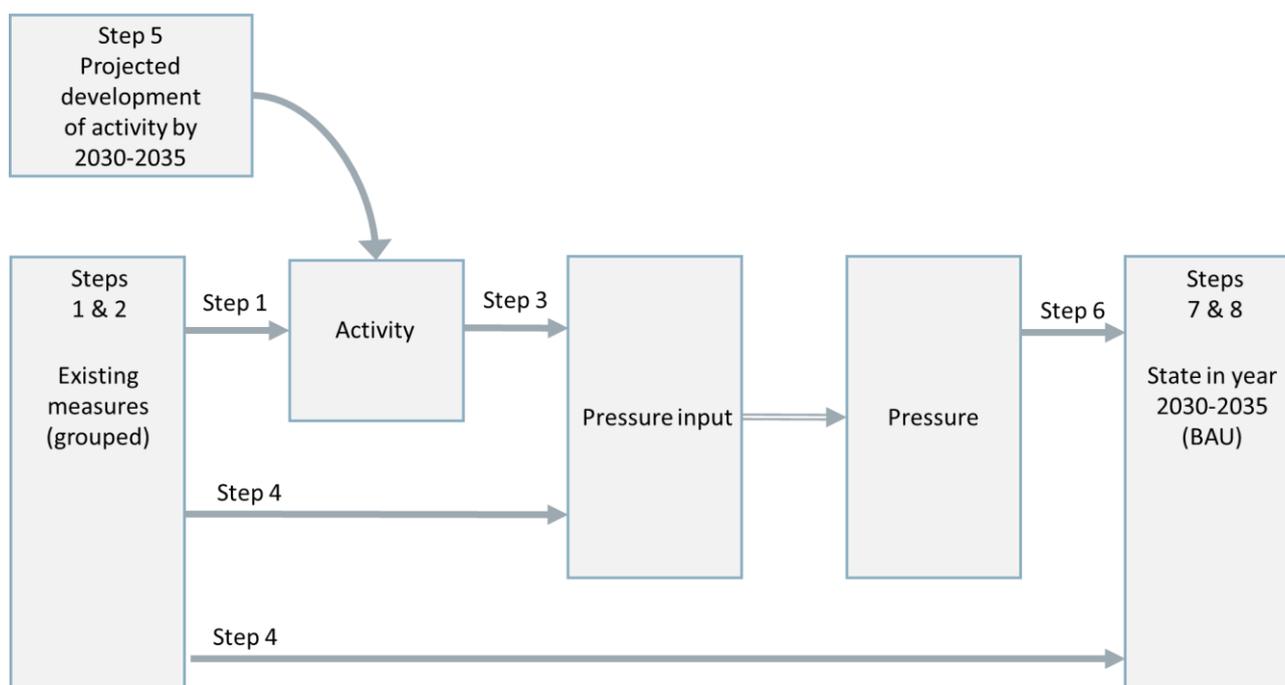
### Background

The SOM analysis involves estimating the status of the marine environment at a specific future point in time, given measures in existing policies, their implementation status and projected development of human activities over time (Figure 1).

The main components of the analysis are assessing: the contribution of activities to pressures (Step 3), the effect of existing measures on pressures (Step 4), the effect of development of human activities on pressures (Step 5), and the effect of changes in pressures to environmental state (Step 6). The result is the state (in terms of pressure reductions or improvements in environmental components) in 2030-2035, which can then be compared to the threshold for good environmental status, when available (Step 7). This allows assessing the probability to achieve GES with existing measures.

It is worth noting that in the SOM analysis, pressure inputs and pressures have been distinguished from each other. their relationship is one of the following: 1) pressure input and pressure are equivalent or assumed to be equivalent, 2) pressure input and corresponding pressure are present in the analysis but no connection is made between them, or 3) only the pressure is present in the model. For eutrophication, both the pressure input (input of nutrients) and pressure (effects of eutrophication) are present in the analysis, but they are not connected (i.e. option 2, see Figure 3). Thus, for some pressures, the analysis has not been able to include a quantitative link between the pressure inputs and pressures. Subsequently, it has not been possible to include reductions in all pressures when calculating the pressure reductions or the probability to achieve state improvements, and thus, the projected pressure reductions and state improvements are likely underestimated in the analysis. In particular, this is the case for the effects of eutrophication, which is a significant pressure to many state components.

A detailed description of the SOM methodology and data collection is presented in [this document](#).



**Figure 1. General schematic of the main components of the SOM analysis**

The SOM analysis presents the first attempt to quantify the effects of existing measures and policies on the environment and achieving objectives. It presents a Baltic Sea level assessment on the overall sufficiency of

existing measures for a variety of environmental topics. The results of the analyses are based mainly on expert elicitation, and thus they should be interpreted appropriately. The findings do not provide complete and final answers on the reductions in pressures or improvements in state and should thus also be considered in relation to other relevant results and assessments.

### Presentation of SOM results

SOM results will be presented in nine topic-specific reports and a main report summarizing the results of the analysis. Topic-specific reports provide information on the background, structure and methodology for the analysis and results for the specific topic. The main report briefly explains the SOM approach and focuses on the results, conclusions, implications and lessons learnt. In addition, there is a methodology report that described in detail the SOM approach, methods and data.

The SOM results are presented in the format of percent shares or probabilities. The main finding of the analysis is the probability to achieve GES or specific state improvements/pressure reductions, taking into consideration the effects of existing measures and changes in the activities on pressures. The contribution of activities to pressures, the effect of measures on pressures, and the significance of pressures to state components are presented as percent values (e.g. how many percent would the measure reduce the pressure). Results are presented mainly in tables, which show the the most likely (expected) values and standard deviations. Standard deviation is a way of showing the variation in the values. When it is high, values are spread over a wider range, and when it is low, values are closer to the most likely value. Figures and graphs presenting distributions are mainly included in the annexes. They show the same results as the tables but allow either more detailed information or alternative visualisation of the results.

For the data that are based on expert surveys, the confidence rating gives the most common answer to experts' assessment of the confidence in their own survey responses on a low-moderate-high scale. More detailed information on how each result has been calculated is presented in [a separate document](#).

### Format of presentation

The format the results are reported in (not presented, qualitative/semi-quantitative, quantitative) depends on the type of result and the number of participating experts. Further, for all results utilizing other SOM results as input data, reporting is done at the most conservative standard used in the input data. In practice this means that if one input data point is reported as 'insufficient data', all results using that data point will also be reported as 'insufficient data'; similarly for qualitative/semi-quantitative data points. However, note that this standard is only applied in the case of data points actively used to calculate another result. For example, many measure types are hypothetical or otherwise not implemented in the Baltic Sea and therefore do not factor into results on projected pressure reductions from existing measures. Insufficient data for such measure types does not affect reporting other results that rely on data for effectiveness of measure types. Results that do not meet the data standards described here and in greater detail below are marked with 'insufficient data' in the report.

For results concerning required pressure reductions and significance of pressures to state components, results with 2 or fewer respondents are not reported; results with 3 to 4 respondents will be either not reported, or qualitatively/semi-quantitatively reported based on feedback from the SOM topic teams or other HELCOM expert body; results with 5 or more respondents are reported quantitatively. This standard allows flexibility for reporting on assessments that are of spatially limited areas and therefore have fewer experts available to survey, while also being somewhat conservative in reporting fully quantitative results.

For expert-based effectiveness of measures results, measure types with 5 or more respondents are reported quantitatively and those with 4 or fewer respondents are listed as having insufficient data.

For expert-based activity-pressure results, expert responses were primarily sought through the HELCOM expert networks in the form of national responses. Individual expert responses were accepted but were consolidated into average responses by country to conform to the format of other responses. Thus, the

maximum number of responses is 9. This maximum is rarely reached due to responses typically only applying to areas adjacent to the specific country. Acknowledging this, activity-pressure relationships are reported if there are expert responses from 3 or more countries or if the number of countries providing expert responses is greater than 1/2 the number of countries bordering any given sub-area (see Table 1 below; responses from experts based in any HELCOM country will be counted toward the reporting threshold, i.e. the reporting assessment is not limited to responses from bordering countries).

**Table 1. Required number of countries providing expert responses to the activity-pressure survey to meet the minimum data threshold for reporting.**

Bordering countries	Required number of countries providing expert responses to meet minimum data threshold	Example areas
1	1	Western Gotland Basin
2	2	Bothnian Sea, Gulf of Riga
3	2	Gulf of Finland
4+	3	Eastern Gotland Basin, Baltic Sea

### SOM results documents

The first results of the SOM analysis are available as nine separate documents (one per topic). They are available in a [dedicated folder](#) on the SOM workspace. The results for the topic of fish is accessible [via this link](#).

Note that due to the timing of FISH 12-2020, the fish results have been partially updated from the original version submitted to the BSAP UP workshops. The update is limited to changes in the numeric results for the effectiveness of measure types, pressure reductions from existing measures, and the presentation of results throughout the report, considering the number of experts contributing to the report. Further revisions will be needed to address other aspects of the identified amendments and revisions listed later in this document.

The documents present the results based on the expert-based data (survey responses). Literature data on the effectiveness of measures have been collected but are not included at this point. The projected development of human activities is based on the most likely future development until 2030 (for details, see the SOM [methodology document](#)).

### Identified amendments and revisions to the reporting and presentation of the SOM results

Several points of development and improvement have already been identified, e.g. based on feedback from the SOM topic teams. This section provides a list of proposed changes to the reporting and presentation of the SOM results, categorized based on their type. They are still to be implemented.

#### General changes

- Correct activity-pressure input data and results
- Implement changes on pressure reductions and state improvements based on changes in activity-pressure contributions for all topics
- Add information on the impacts of measure types that combines information on the effectiveness of measures types and activity-pressure contributions
- Add literature data on effectiveness of measures to the input data
- Add alternative human activity scenarios (no change, small, large change) to the results in addition to the current most likely to assess their effect on results
- Add description of the human activities scenarios and how they impact the outcomes to help understand and correctly interpret the results, explain which activities change and affect pressure reductions and which activities do not
- Add information on the state components most affected by the pressure in question (e.g. significance of effects of litter on state components)

- Ensure that the concept of pressure inputs and pressures is applied consistently across topics
- Address caveat that most data are based on the opinion of a limited number of experts
- Add explanations, interpretations and conclusions on the results
  - a. Specifically, regarding the most important pressures that affect the gap to GES, and the existing measures in place for those pressures and where are the gaps in terms of measures and pressures.
- Add information on what purposes the results could be used
- Add information on the practical implications of the work and how to use the results
- Include in all figures and graphs the number of experts contributing to the result. Also, standard deviations or confidence intervals should be included in the graphs, where appropriate
- Include more information on the relationships between measure types. For example, some are alternative versions of a measure where only one version can be implemented
- Take standard deviations better into account when presenting and interpreting the results
- Consider which scenario to use as the default scenario for the projected changes in human activities due to effects of COVID-19
- Add information on the credibility of the results and how they should (and should not) be interpreted
- Achieving GES/state improvements/pressure reductions
  - a. Include information on how many experts answered what
  - b. Consider a simpler way of presenting results than the current graphs, especially graphs on cumulative probability functions are rather difficult to read
  - c. Add more information on the most recent status assessment and GES threshold to help evaluate and interpret the results
  - d. Clarify the explanation on the consequences of not being able to account the effect of all pressure input reductions on state components in the analysis
- Projected pressure reductions
  - a. Clarify what is the difference between reductions in pressure inputs vs. effectiveness of measure types (pressure reduction takes into account information on existing measures and activity-pressure contributions)
  - b. Add information on which measures are driving the pressure reductions
  - c. Clarify when pressure reductions can be negative, zero or positive
  - d. Explain the role of changes in human activities on pressure reductions
  - e. Clarify what is the baseline (BAU vs. existing measures that have an effect in 2016-2030/2035)
- Effectiveness of measure types
  - a. Indicate which measure types are hypothetical and which have a corresponding existing measure, and look into whether it is possible to indicate whether a measure type has been/is being implemented
  - b. Clarify that the effectiveness is presented per activity, not across all activities, and does not take into account activity-pressure contributions, i.e. the measure type reduces XX% of the pressure input from the specific activity and not of the total input
- Activity-pressure contributions
  - a. Clarify what are activities and sources outside the Baltic Sea

#### *Topic-specific changes*

- Fish
  - a. Indicate which are assessed based on GES in Table 3
  - b. Ensure that the correct spatial scale is used in Table 5
  - c. Add comparison to ICES assessments/results to provide reflections and interpretations to the results of achieving GES/state improvements.
  - d. Review results for cyprinids in the Gulf of Finland and herring in SD 30-31, and make changes if necessary.

#### *Editorial changes*

- Improve outlook, presentation and explanation of graphs and figures, and provide an example showing how they should be interpreted

- Decimals in data tables could be taken out and numbers rounded to integers (completed for eutrophication)
- Add what data have been used in the calculation in each table caption
- Check that NA is always explained in the tables

### Validation of input data to the SOM analysis

Working Groups and Expert Networks were invited to validate the input data to the SOM analysis. Fish was responsible for validating the input data for fish, as indicated in [this document](#).

The validation was done intersessionally via email communication in September. Nationally coordinated responses, or responses coordinated by the Working Group were preferred, but responses from individual experts and representatives were also welcomed. For details and instructions for validating the data, see [this document](#).

Comments for the request for data validation were received for the topics of litter, benthic habitats, input of nutrients, birds, mammals, fish, non-indigenous species and noise. They resulted in changes to the litter activity-pressure contributions data. Other comments were of general nature or related to the presentation of the results. Questions were replied to by email, and the comments will be reflected in the final reports, as possible. Most of the comments were sent by individual experts/representatives.

### Schedule of the SOM work in the autumn 2020

Table 2 presents the remaining tasks in the SOM analysis of existing measures and their timetable in the autumn 2020. The work is carried out by the ACTION project, the SOM Platform, SOM topic teams and the HELCOM Secretariat, with input and guidance from HELCOM groups and networks.

First results of the SOM analysis have been provided as background information to the BSAP UP workshops in August and September 2020. Input data to the SOM analysis are sent for validation to HELCOM Working Groups and Expert Groups in August/September 2020. The results of the SOM analysis are also provided to Working Groups' fall meetings for review. Both the main report and topic reports, describing the methodology and results of the analysis, will be finalized by the end of 2020.

Final SOM results will be available in October following SOM Platform 4-2020 and validation of input data by Working Groups and Expert Networks, both taking place in September.

Note that in addition to SOM analysis of existing measures, ACTION project is conducting a cost-effectiveness analysis of proposed new measures for the updated BSAP.

Table 2. Timeline for SOM analysis of existing measures

Task	Responsible	Timing (month in 2020)
<b>BSAP UP workshops</b>	Secretariat, experts	August-September
<b>Validation of input data</b>	Working Groups, Expert Networks	September
<b>SOM Platform 4-2020 meeting</b>	SOM Platform/Secretariat	September
<b>Providing results to Working Group meetings</b>	ACTION/Secretariat	August-October
<b>Preparing overall and topic-specific reports to support BSAP update</b>	ACTION/Secretariat	June-December
<b>Potential SOM Platform 5-2020 meeting</b>	SOM Platform/Secretariat	30 November