Baltic Marine Environment Protection Commission

HELCOM BalticBOOST Workshop on the HOLAS II Biodiversity assessment tool

Copenhagen, Denmark, 11-12 February 2016

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Background

This document contains an overview of the Biodiversity assessment of HOLAS II and the existing guidance from the HOLAS II Core team for the development of the assessment. The document is based on the Outcome of HOLAS II 4-2015, with an updated timeline.

Action required

The Meeting is invited to take note of the information and use the information when proposing how the biodiversity assessment tool should be developed.

Overall structure of the HOLAS II assessment

The HOLAS II project will give an update on the overall state of ecosystem health in the Baltic Sea, following the initial HELCOM holistic assessment that was published in 2010. The assessment will follow up on the goals of the Baltic Sea Action Plan, and will be developed so that the results will support reporting under the EU Marine Strategy Framework Directive (MSFD) by those Contracting Parties to the Helsinki Convention that are also EU member states.

Methods and tools for the status assessment are developed as part of the project. The HELCOM core indicators form the basis for the assessment of environmental status. Aggregated results are produced using assessment tools, which are developed and tested as part of HOLAS II and the supporting EU co-financed project BalticBOOST.

The main components of the assessment are:

- Distribution of human activities and pressures in the Baltic Sea. Cumulative impacts are assessed using the Baltic Sea Pressure and Impact Index.
- Assessment of good environmental status using core indicators, and integrated assessments of Biodiversity, Eutrophication, and Hazardous substances.
- Economic and social analyses to support regional assessments of the use of marine waters and cost of degradation.
- Measures to reach good environmental status

The main results of the assessment are planned to be published in a ca 90 pages printed report (also available as pdf) and more detailed information will be presented as associated products in the form of web based information, downloadable fact sheets and thematic reports, to be defined further.

Summary of the HOLAS II Biodiversity assessment

The biodiversity assessment within HOLAS II aims to assess the status of biodiversity in the Baltic Sea, based on regionally agreed core indicators and their associated definitions of good environmental status. The results are to be reported as part of the HOLAS II report. The assessment will be carried out using a tool for biodiversity assessment which will be developed and made available for the HOLAS II project as well as Contracting Parties in order to perform assessments.

Expected contributions of BalticBOOST to the biodiversity assessment

The EU-cofinanced project BalticBOOST project will support the development of the biodiversity assessment tool. The project was started in September 2015 and will finish in December 2016. However, finalization of the tool development is required by mid-November 2016 in order to allow endorsement through HELCOM procedures.

WP 1.1 of the BalticBOOST project will develop and test an assessment tool to be applied in the HOLAS II biodiversity assessment. The outcome of the project is a tool to carry out the assessment, including test runs to display the performance of the tool, and guidance documents for how to use the tool in order to achieve a regionally coherent assessment.

The development of the assessment tool is to be based on guidance from State & Conservation, the HOLAS II Core Team and HELCOM workshops carried out under the BalticBOOST project. A draft initial guidance is presented in Annex 2. The tool development should also consider General points for the planned assessment and tool development (Annex 3), as based on the outcome of (HELCOM Biodiv WS 1-2015).

Table 1. Timeline for the HOLAS II Biodiversity assessment

	2014		2015				2016				2017				2018	
		Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2
Core indicator development																
Data arrangements and data collation																
Assessment of status by core indicators																
Updated core indicator fact sheets																
Concept development for the integrated assessment																
Assessment method and tool development																
Decide on methods to use																
Assessments																
Publication of first results																
Updates as needed																
Workshops on the biodiversity assessment																
HOLAS II Biodiv 1-2015; 15 Jun 2015																
HELCOM BalticBOOST Biodiv 1-2016, 11-12 Feb 2016																
HELCOM BalticBOOST Biodiv 2-2016. Tent. Sep 2016																
HOLAS II Biodiv 2-2017. Tent. Feb. 2017																

Overall plan for the biodiversity assessment

The content of this section, including **Annex 1-3**, is identical to that of document 4-1 of HOLAS II 4-2015, with the exception that the timeline presented in that document is replaced by the timeline shown above.

The section outlines the current state of key steps to be taken in the overall biodiversity assessment:

- Development of the biodiversity assessment tool
- Indicators to be included
- Data arrangements

Extracts from the Outcome of HOLAS II 4-2015 referring to the biodiversity assessment are provided in **Annex 4**.

Indicators to be included and their proposed grouping

The biodiversity assessment should build on regionally agreed core indicators. The current list of indicators is given in Annex 3 and more detailed information on each of these is found at www.helcom.fi/baltic-sea-trends/biodiversity/indicators. The biodiversity assessment is to consider all indicators relevant for the BSAP biodiversity assessment and the state based variables within descriptors 1, 3, 4 and 6 of the MSFD.

The HOLAS II core team has considered how to deal with gaps in the existing set of core indicators that may affect the robustness of the results, and the possibility to fill critical gaps with other indicators if such gaps still exists by spring 2017 when the biodiversity assessment will first be carried out. Such a provision should follow clear principles, and should be considered in separate for each case. The principles for tentative indicator inclusion were provided by HOLAS II 3-2015 (para 3.13) and are included in Annex 1. It can be noted

that development of indicators continues in HELCOM during 2016 with the view of filling as many gaps as possible in the core set of indicators.

The assessment will cover indicators with different approaches for determining GES. The optimal way of representing results for each indicator needs to be considered. These considerations are to be developed further hand in hand with the tool development process. Potential assessment approaches to consider include eg: +ve, -ve, two-component and the-component indicators and trend-based assessments. The current approaches for each indicator are described in the Core indicators fact sheets.

The indicator results should be integrated into groups as identified by the MSFD, based on available guidance as agreed by HOLAS II and the two HELCOM workshops carried as part of the BalticBOOST project. A current proposed grouping is given in Annex 3. However, late changes in guidance in relation to the EU reporting is foreseen. In order to encompass this, and since different end user will need to access information at different levels of detail, the tool should give assessment outputs for a variety of options, such as the level of biological elements, criteria and descriptors.

Data arrangements and assessment

The biodiversity assessment will be carried out in the beginning of 2017 and arrangements to ensure data provision are to be developed in early 2016. In order for the indicator-based assessments to be ready by early 2017, the underlying data should be reported by September 2016 the latest. Development projects during 2016 (WP1.2, WP1.3 of BalticBOOST, Direct EU Grant application TAPAS) are expected to contribute with solutions in support of this, e.g. through the development of joint HELCOM databases for birds, coastal fish and seals which is currently lacking.

The planned assessment will cover the years 2011-2016. The data provision to the assessment should be completed by the end of 2016, in order for the assessment at regional scale to be carried out and be finalised by May 2017. Missing data for the year 2016 may be supplemented until the end of 2017 for inclusion in the final version of the report in early 2018.

Data should be provided for the assessment by Contracting Parties reporting data to dedicated databases (COMBINE or others available at that time). If no other possibility is available HELCOM expert groups/projects may be requested to provide appropriate data extraction and delivery of data and/or calculated data products (indicator evaluations) to HOLAS II.

As part of the assessment, a HELCOM HOLAS II workshop is proposed in early 2017 with participation of national experts in order to evaluate and quality assure the assessment results.

Details to the time line for the tool development

The planning phase of the BalticBOOST project will consider the outcomes of the MSFD common implementation strategy, and the contributions of HELCOM experts from the Contracting Parties to the tool development. The planning phase will concentrate on detailing the tool description based on the MSFD CIS, HOLAS II Core team guidance and published results from relevant research projects. This tool description will also include an account of the (core) indicators to be included, the assessment units to be applied and relate these to the technical requirements on the tool.

The development phase will start in February 2016 and during this time the tool will be developed. The development phase will build on the outcome of the planning phase, including the outcome of the first planned HELCOM workshop to be carried out under the BalticBOOST project. The tool development will include programming in order to set the tool into operational use by Contracting Parties.

Preliminary runs of the developing tool will require real data on the HELCOM core indicators in specified pilot areas. The results are to be presented to the second HELCOM workshop to be carried out under the BalticBOOST project, tentatively to be held in September 2016. Where necessary, alternative assessment scenarios will be compared. Potentially also, the results can be compared with knowledge on predominant pressures in the pilot areas where possible.

The dissemination phase will finalise the project output, which are a documentation of the tool and the assessment tool itself. During autumn 2016, Contracting Parties are also able to initiate the assessment work, by data preparations and familiarising with the tool.

Finalisation. The biodiversity tool description and its assessment guidelines are to be finalised in time to be presented to HELCOM HOD in December 2016. This implies that the tool and associated documentation needs to be ready by mid-November 2016.

Annex 1. Principles for tentative use of additional indicators in the biodiversity assessment

- "if national indicators are included they are to complement the set of core indicators and not be conceptually redundant,
- development of assessment tools will not be carried out with the aim of enabling the use of national indicators,
- indicators shared by several countries around one sub-basin could be used, currently such indicators have not yet been identified and this issue could be taken forward through bilateral discussions."

Annex 2. Initial guidance for the development of biodiversity assessment tool through BalticBOOST

The biodiversity assessment within HOLAS II aims to provide an assessment of the status of biodiversity in the Baltic Sea based on regionally agreed core indicators and their associated definitions of good environmental status. The results are to be reported as part of the HOLAS II report. The assessment will be carried out using a multi-metric indicator-based tool for assessment of 'biodiversity status' which will be developed and made available for the HOLAS II project as well as Contracting Parties in order to perform assessments.

WP 1.1 of the BalticBOOST project will develop and test an assessment tool to be applied in the HOLAS II biodiversity assessment. The outcome of the project is a tool to carry out the assessment, including test runs to display the performance of the tool, and guidance documents for how to use the tool in order to achieve a regionally coherent assessment. The work will as far as possible build on several recent projects, which have developed tools for biodiversity status assessments and entail features that could potentially support the HOLAS II biodiversity assessment.

- The first holistic assessment was based on the BEAT tool[1], which has later been developed further within the HARMONY project, and applied in an evaluation of status in the Danish Kattegat area1[2].
- The Life + Marmoni project developed a biodiversity tool that is aligned with the existing MSFD descriptor requirements, focusing on descriptor 1 (Biodiversity)[3].
- The EU 7th framework project DEVOTES is developing a flexible, hierarchical and modular tool for assessment of 'biodiversity status' including some additional structures, such as flexible aggregation principles, several weighting principles, a fully data driven confidence assessments and full documentation of choices made (back log). An open source software will be developed in 2016.

Existing tools from related projects and important aspects for the HOLAS II biodiversity assessment tool were considered by HOLAS II 3-2015 and the HELCOM Workshop to support the development of a biodiversity assessment tool (HELCOM Biodiv WS 1-2015). The meetings agreed that results from existing projects should as far as possible be considered in the development of the HOLAS II biodiversity assessment tool, in order to build on existing available knowledge, but concluded that none of the existing tools were suited to directly support the requirements of HOLAS II. The key requested features of the planned HOLAS II Biodiversity status assessment are outlined in Annex 2, based on these meetings. Further details are given in the notes from HELCOM Biodiv WS 1-2015.

[1] HELCOM (2010) http://www.helcom.fi/Lists/Publications/BSEP122.pdf
[2] Andersen et al. (2014) Integrated assessment of marine biodiversity status using a prototype indicator-based assessment tool. Front. Mar. Sci., 29 October 2014 http://dx.doi.org/10.3389/fmars.2014.00055
[3] www.sea.ee/marmoni/index.php

Annex 3. General points for the planned assessment and the tool development

These general points apply to the assessment of biodiversity and hazardous substances.

1. **Output formats.** The planned output of the assessment should be driven by the needs of the anticipated users, keeping in mind the large general interest in the results and the fact that different end users have different need of detail and presentation. In order to cover these aspects, the assessment results could be directed towards the perspectives of three perceived end user types; "the Minister", "the Manager", and "the Neighbor". On a general level, the assessment should answer the question "what is the state of hazardous substances in the Baltic Sea" in all three cases and presentation formats should be developed and tested against end users.
2. **Tool access and availability**. The assessment tool should be user-friendly, easily accessible and accompanied by clear guidance and documentation. This could be accomplished by making the hazardous substance tool available over a website or a workspace in the HELCOM portal, the main priority being that the tool is made available to HOLAS II and Experts/Contracting Parties to perform assessments and explore the tool based on own data. In order to ensure comparability and consistency across the Baltic Sea region, a guidance document on how to carry out the assessment in accordance with the aims of HOLAS II should be provided. Potentially, access to the tool could be enabled with different levels of permission, for example i) full access ii) performing assessments, iii) viewing the results of assessments.
3. **Input data**. The tool should provide a clear guidance on data input, including data formats and guidance on what data are relevant and correct to include. The data interface should give the possibility to easily upload large data sets when needed. The entered data should be documented and traceable to the data provider.
4. **Indicators included.** The tool should primarily be developed to support an assessment based on regionally agreed indicators (core indicators). The tool should enable the inclusion of different types of approaches for determining GES. The optimal way of including each core indicator into the assessment, in order to reach a credible overall assessment, should be considered as part of the tool development process. Potential assessment approaches to consider include eg: +ve, -ve, two-component and the-component indicators and trend-based assessments. The current approaches for each indicator are described in the Core indicators fact sheets.
5. **Integration**[4] **levels.** The tool should make it possible to extract assessment results at different levels of integration, identified based on HOLAS II overall guidance and needs expressed by the Contracting Parties. The tool should be able to deal with potential biases in the assessment that may arise when different numbers of indicators are included for different categories/compartments.
6. **Integration rules.** The integration rules applied (e.g. one-out-all-out/averaging/weighted averaging) should agree with relevant EC guidance and comply with the assessment-related properties of the input data. Different integration rules may be applied at different layers of integration. The applied rules should be clearly motivated based on existing published work[5,6] or developments within BalticBOOST.

[4] Integration=the combining of data for different indicators within a group, e g marine elements, criteria or descriptors; or putting together results from smaller assessment units to larger units

[5] Caroni R, van de Bund, W, Clarke RT, Johnson RK (2012) Combination of multiple biological quality elements into waterbody assessment of surface waters. Hydrobiologia 704 (1): 437-451 http://link.springer.com/article/10.1007/s10750-012-1274-y

[6] Borja A, Prins TC, Simboura N, Andersen JH, Berg T, Marques J-C, Neto JM, Papadopoulou N, Reker J, Teixeira H, Uusitalo L (2014). Tales from a thousand and one ways to integrate marine ecosystem components when assessing the environmental status. http://dx.doi.org/10.3389/fmars.2014.00072

7. **Assessment units.** The geographical scale of assessment should follow the hierarchical scale developed for core indicators. Aggregation[7] rules should be developed in order to provide ecologically sound assessment results at each of the following geographical levels: 1= Baltic Sea scale, 2= each of the 17 Baltic sub-areas, 3= the 17 Baltic sub-areas further separated in to coastal and offshore areas and, 4= coastal areas split into WFD waterbodies or -types. The 4th level is needed when the GES-boundary applied is an EQS derived under WFD, as per guidance of WG GES (5-6 October 2015). By this, the tool would make it possible to "zoom in" to the most detailed assessment scale, still including all applicable indicators within the assessment. In addition, the tool should make it possible to display the outcome country-wise to the extent that it is needed in order to support national MSFD reporting.
8. **Uncertainty assessment.** The assessment should give an estimate of confidence in the assessment (uncertainty), given by data quality aspects and statistical uncertainty, or as a minimum in the form of scores according to identified criteria. Level of confidence should be detectable at two levels: i) at the scale of each indicator, relating to aspects of data quality and the developmental stage of the indicator and ii) at the scale of the integrated assessment. Criteria for how to assign confidence scores should be developed as part of tool development, including data formats and guidance for how to include information on uncertainty in the assessment.
9. **Results.** In addition to showing the assessment results and the uncertainty assessment, the assessment output should show what data and indicators were included, and the applied integration method. The number of indicators available per group/level should be displayed. In cases where no data is available for a certain group, the output should distinguish between missing data due to biological reasons and due to lack of monitoring. Possibilities to give information on distance to GES as part of the integrated assessment should be explored.
10. **Terminology.** A glossary for terminology used should be provided together with the guidance document. The glossary should agree with MSFD vocabulary whenever relevant.

[7] Aggregation=the merging of information for one indicator within a defined assessment unit or assessment period in order to get a representative estimate

Annex 3. Core indicators tentatively available for the biodiversity assessment

The biodiversity assessment is to consider all indicators relevant for the BSAP biodiversity assessment and the state based variables within descriptors 1,3,4,6 of the MSFD. Pre-core indicators should be included if adopted as Core indicators by HOD on December 2016. NB also study reservations on the core indicators by Germany and Denmark.

SHORT NAME	Indicator name	State of develop-ment	State (S)/ Pressure (P)	Element (will be revised)	Desc-riptor	Primary criterion
BENTHIC VEG DEPTH	Lower depth limit distribution of the macrophyte community	Pre-core	S	BENTHIC HABITATS	1	1.5
BENTHOS DISTR HABITATS	Distribution, pattern and extent of benthic biotopes	Pre-core	S	BENTHIC HABITATS	1	1.4
BENTHOS POP STRUCTURE	Population structure of long-lived macrozoobenthic species	Core	S	BENTHIC HABITATS	1	1.3
BIRDS ABUND BREED	Abundance of waterbirds in the breeding season	Core	S	BIRDS	1	1.2
BIRDS ABUND WINTER	Abundance of waterbirds in the wintering season	Core	S	BIRDS	1	1.2
COMM FISH 3.2	D3.2 FISH (ICES)	Core	S	FISH	3	3.2
COMM FISH 3.3	D3.3 FISH (ICES)	Core	S	FISH	3	3.3
FISH COAST FUNC	Abundance of coastal fish key functional groups	Core	S	FISH	1	1.6
FISH COAST KEY	Abundance of key coastal fish species	Core	S	FISH	1	1.2
FISH LFI	Proportion of large fish in the community	Core	S	FISH	4	4.2
FISH LMAX	Maximum length fish in the pelagic community	Pre-core	S	FISH	4	4.2
FISH SALMON REPR	Abundance of salmon spawners and smolt	Core	S	FISH	1	1.2
FISH SEATROUT REPR	Abundance of sea trout spawners and parr	Core	S	FISH	1	1.2
PELA DIATOM DINOS	Diatoms/dinoflagellates index	Pre-core	S	PELAGIC	4	4.3
PELA SEASON SUCC	Seasonal succession of functional phytoplankton groups	Pre-core	S	PELAGIC	4	4.3
PELA ZOOPLANKTON	Zooplankton mean size and total stock	Core	S	PELAGIC	4	4.3
SEAFLOOR BQI	State of the soft-bottom macrofauna community	Core	S	BENTHIC HABITATS	6	6.2
SEALS DISTR	Distribution of Baltic seals	Core	S	MAMMALS	1	1.1
SEALS NUTRITION	Nutritional status of marine mammals	Core	S	MAMMALS	1	1.3
SEALS POP	Population trends and abundance of seals	Core	S	MAMMALS	1	1.2
SEALS REPR	Reproductive status of marine mammals	Core	S	MAMMALS	1	1.3

Annex 4. Extracts from the Outcome of HOLAS II 4-2015, points referring to the biodiversity assessment

4.1 The Meeting took note of the plan for the biodiversity assessment within HOLAS II as presented by Ms Lena Bergström, Project coordinator HOLAS II (document 4-1, Presentation 1).

4.2 The Meeting took note that the four essential components for the HOLAS II biodiversity assessment are the tool development, indicator development, data arrangements, and to carry out the assessment. The development of the tool will be accomplished under the BalticBOOST project WP 1.1 and two HELCOM workshops are planned during 2016 to guide the development of the tool.

4.3 The Meeting took note that data required for the assessment of core indicators for the holistic assessment need to be delivered by September 2016 at the latest (cf. paragraph 3.7) to give the opportunity for HELCOM expert groups, projects and networks to update the indicator evaluations by early 2017 for further use in the biodiversity assessment. The Meeting requested the Secretariat to adjust the time plan in document 4-1 to clarify the time requirements.

4.4 The Meeting noted the preliminary proposal to carry out the biodiversity assessment centrally based on indicator evaluations supplied by relevant expert groups, networks and projects, that a workspace would be set up, if possible, for evaluation by Contracting Parties, and that a workshop could be arranged to quality assure the results in spring 2017. The Meeting noted that the HOLAS II project may need to be supported with additional resources to carry out the biodiversity assessment and to support the writing of the assessment report.

4.5 The Meeting recalled that the 2nd holistic assessment will primarily be based on the regionally agreed core indicators however that the use of supplementary national indicators have been considered by the project and that principles for tentative use of national indicators was proposed by HOLAS II 3-2015. The Meeting agreed that a decision of the use of supplementary indicators will take place when a more complete picture of available indicators is in place e.g. by HOLAS II 5-2016.

4.6 The Meeting recalled that despite the different approaches for defining GES, all indicators should be possible to include in the tool.

4.7 The Meeting took note of the view of Germany that for appropriate indicators the assessment of Favourable Conservation Status (FCS) and other relevant reporting obligations under the Habitats Directive should be considered for use in the biodiversity assessment. The Meeting noted that the BalticBOOST WP 1.4 will provide a comparison, based on data for seal abundance and distribution, of assessment results using criteria under the HD and MSFD respectively and that the results can provide a basis for deciding on the use of FCS assessments in HOLAS II. The Meeting also noted that the Marmoni project has looked into this issue and that the results can provide guidance in this regard.

4.21 The Meeting welcomed the outcome of the EUTRO-OPER project (document 4-3) and supported the use of similar workspaces as developed by EUTRO-OPER for other topics such as hazardous substances and tentatively for biodiversity, and noted that the TAPAS project, if funded, will support this development.