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Background

The [Second HELCOM Indicator Workshop](#) took place in Copenhagen on 16-18 October 2019. This Workshop addressed a number of aspects raised from the policy-focused review of HELCOM indicators that took place at the [First HELCOM Indicator Workshop](#) (14-15 May 2019, Berlin). Preliminary policy priority, and identification of important topics (see [Terms of Reference, ToRs](#)), was carried out based on a [review and policy matching spreadsheet/document](#) that links the existing HELCOM indicators (and other proposals) to the Baltic Sea Action Plan (BSAP), Marine Strategy Framework Directive (MSFD) and an initial linkage to the UN Strategic Development Goals (SDGs). In addition to addressing areas identified as preliminary policy priority, the Second Indicator Workshop participants were asked to provide input on a range of other issues, such as: how to improve the third holistic assessment of the ecosystem health of the Baltic Sea (HOLAS III), what could be expected per topic by HOLAS III, what resources are required to achieve the proposed work, and to document a [Workplan](#) (per topic) that could complement the previously developed Topic Summaries (see [documents 1-11](#): on By-catch, Fish, Waterbirds, Marine mammals, Pelagic habitats, Non-indigenous species (NOTE: no work plan developed at Workshop), Benthic habitats, Hazardous substances, Marine Litter, Underwater noise, and Eutrophication). When developing the work plans participants were request to consider all aspects in the workshop ToRs, including the [guidance](#) (page 6 in particular) provided by HELCOM Contracting parties that are also EU Member States via the GEAR Working Group.

The current document is submitted to GEAR 21-2019 and also provided as cc to State and Conservation contacts, with the option for them to provide additional feedback to their national GEAR representative. In addition the workplans have been supplied to all relevant Expert Groups with the option to comment to the Secretariat and group Chair(s) by 1 November (after which comments will be reflected in any necessary updates of the workplans revised for GEAR 21-2019).

The recommendations of the Workshop are provided in this document and detailed workplans per topic are provided as links under each section (available through the document library of the Second HELCOM Indicator Workshop site). HELCOM GEAR and State and Conservation Working Groups have been provided with access to the document library.

Action requested

The Meeting is invited to:

- [discuss](#) the output from the Second HELCOM Indicator Workshop and the Workplans developed per topic; and
- [discuss](#) the information and action request that is to be submitted to HOD 57-2019.

Future work on HELCOM Indicators - Workplans per topic and Workshop output

The [Second HELCOM Indicator Workshop](#) took place in Copenhagen on 16-18 October 2019. This Workshop addressed a number of aspects raised from the policy-focused review of HELCOM indicators that took place at the [First HELCOM Indicator Workshop](#) (14-15 May 2019, Berlin). Preliminary policy priority, and identification of important topics (see [Terms of Reference](#), ToRs), was carried out based on a [review and policy matching spreadsheet/document](#) that links the existing HELCOM indicators (and other proposals) to the Baltic Sea Action Plan (BSAP), Marine Strategy Framework Directive (MSFD) and an initial linkage to the UN Strategic Development Goals (SDGs). In addition to addressing areas identified as preliminary policy priority, the Second Indicator Workshop participants were asked to provide input on a range of other issues, such as: how to improve the third holistic assessment of the ecosystem health of the Baltic Sea (HOLAS III), what could be expected per topic by HOLAS III, what resources are required to achieve the proposed work, and to document a [Workplan](#) (per topic) that could complement the previously developed Topic Summaries (see [documents 1-11](#): on By-catch, Fish, Waterbirds, Marine mammals, Pelagic habitats, Non-indigenous species (NOTE: no work plan developed at Workshop), Benthic habitats, Hazardous substances, Marine Litter, Underwater noise, and Eutrophication). When developing the work plans participants were request to consider all aspects in the workshop ToRs, including the [guidance](#) (page 6 in particular) provided by HELCOM Contracting parties that are also EU Member States via the GEAR Working Group.

The following recommendations were also provided by the Workshop, covering a number of topics relating the structure, presentation, application and use of HELCOM indicators.

HOLAS III

- Do not do an 'update' step with an additional year of data.
- Produce the thematic assessments first, and the holistic/summary assessment after.
- Ensure Expert Groups are involved in relevant steps of any update of the BSPI/BSII.
- Encourage effort to improve data flows, including as short as possible lag in data availability.
- Ensure other supporting information (research and national) is incorporated to provide a scientifically and ecologically relevant overview/context.
- Carry out thematic Workshops at strategic points to get full potential from the available data
 - For example: 1) to develop an overview of each theme, 2) understanding and interpretation of integration step, and 3) cross-linkages (e.g. between themes, e.g. biodiversity-eutrophication).
 - Thematic approach should bring together all relevant people (across groups) at appropriate time (e.g. avoid overlap and duplication of work).

Role of HELCOM indicators (e.g. in HOLAS III)

- Operational core indicators (e.g. based on national monitoring data and having threshold values) should form the major basis of the assessment, though other relevant or supporting data/information and needs to be considered.
- Operational core indicators should form basis of the integrated assessments (e.g. for Biodiversity, Eutrophication and Hazardous Substances).
- Other supporting information should be used to provide a context and broad thematic assessment (e.g. relevant data calls, other national monitoring data, and other available data or research).
- The summary report should present an ecologically relevant assessment of the state of the Baltic Sea environment, of which the indicator-based assessment is a core component. Additional relevant 'non-indicator' data strands, e.g. Economic Social Analyses or other are to be included to ensure full coverage and relevance.

- Address BSAP objectives and support the needs of HELCOM Contracting Parties that are also EU Member States.

New structures needed to support the ongoing indicator work

- An expert group on pelagic habitats (EN PELAGIC) – combining the expertise already in place within the HELCOM Phytoplankton Expert Group (PEG) and the HELCOM Zooplankton Expert Network (ZEN). This would provide a platform for common development of pelagic work rather than (taxonomically) separate development work on indicators and assessments.
- A correspondence group on Foodwebs (CG FOODWEB). This would provide a forum to bring together relevant participants from existing HELCOM Expert Groups (e.g. EG MAMA, JWG BIRD, EN BENTHIC, ZEN, PEG) to continue the initial discussions started at the Workshop (see relevant Workplans). This would provide a solid platform for future work but also improved the reflection of pelagic habitats in HOLAS III.
- Cooperation with OSPAR via joint OSPAR-HELCOM Correspondence Group on Non-indigenous species (NIS) would provide a platform for common development and improvement of the existing assessment.
- Maintaining the interlinkages concept (i.e. linkages between themes) aspect initiated at the Workshop, in particular during the HOLAS III process.

Application of a causal framework

- A causal framework should be applied (based on [‘discussion started’ presented](#)).
- Retaining comparable system to existing causal frameworks would be beneficial.
- Need for clear definition of each component before implementation.
- Including the HELCOM ESA Network in further discussion would be valid (including discussion on how to build relevant information to establish a causal framework for existing indicators).
- Causal framework could be applied to define categorisation of indicators in presentation system (e.g. as pressure, state, driver indicators).

Structure and presentation of HELCOM indicators

- New visuals and ‘higher level’ website placement would improve use and accessibility (based on [‘discussion started’ presented](#)).
- The altered structure would benefit the indicators and help the application of a causal framework.
- Avoid extensive re-invention of the system (more as a re-organisation or existing content exercise).
- Consideration should be given to the specific grouping or sub-grouping of indicators for presentation purposes in the final product.
- Use of terminology should be well defined in final version (e.g. trend, surveillance, etc).
- ‘Chapters’ (indicator sub-sections) on pressures, conclusions (relevance), and climate are relevant.
- The chapter related to climate could be expanded to consider natural conditions that influence the indicators, such as time-lags and recovery-lags
- A ‘filter’ application should be maintained so user can select/arrange the indicators on the webpage based on user needs (e.g. BSAP objectives, MSFD Descriptor).

Other issues raised with relevance to the indicators and HOLAS III

- A discussion may be valid regarding a common approach/understanding/definition for threshold value setting. For example, defining good status, and addressing relevance of conservation perspective, sustainable use of ecosystem, or ecosystem services angle.
- Discussion on a comparable way to ‘integrate’ or include the additional supporting information (i.e. scientific contextual information) into the overview of each thematic assessment. This should be done in a common way across all themes.

Topic specific summaries

Each workplan (see links under each section) provides information in response to the following questions:

- What is the optimal assessment?
- What will be achieved by HOLAS III (e.g. operational indicators by autumn 2021), and how?
- What aspects of the identified work represent the highest priority?
- Is the proposed assessment policy relevant and ecologically relevant?
- What are the resource needs (and period) to 1) carry out the work by HOLAS III (autumn 2021), and 2) for longer-term development issues (post-HOLAS III)?
- What integration of the indicators (i.e. those defined in question 2) is foreseen in HOLAS III?
- What across-theme issues exist (e.g. links between biodiversity and eutrophication) and how will these be considered in future assessments? NOTE: this latter section is commonly discussed in separate specific 'linkages' documents, see below.

The following topic workplans are available:

[By-catch workplan](#)

[Fish workplan](#)

[Waterbirds workplan](#)

[Marine mammals workplan](#)

[Pelagic habitats workplan](#)

[Benthic habitats workplan](#)

[Hazardous substances workplan](#)

[Marine litter workplan](#)

[Underwater noise workplan](#)

[Eutrophication workplan](#)

[Foodwebs workplan](#)

[Biodiversity-Eutrophication linkages](#)

[Biodiversity-Pollution linkages](#)

The following sections attempts to provide a brief summary and overview of what can be achieved per topic by HOALS III, and the potential resource implications, extracted from the more detailed workplans.

By-catch

The [by-catch workplan](#) proposed that pilot evaluations for some species, based on recommendation from the joint OSPAR-HELCOM bycatch workshop should be viable and that risk maps (as being developed within the HELCOM ACTION project) could be used to complement the overall assessment. Further details are provided in the workplan (see pages 1-4).

While monitoring and data availability significantly influence the operationalisation of this indicator the proposed work would provide steps towards this goal and represent an improved overview of the topic by HOALS III.

An initial review of how to achieve this by HOALS III and the resource requirements (where information was available) is also provided, work plan page 5. In brief the work plan identifies the need for support from relevant Expert Groups and national experts for the indicator leads (e.g. providing information and review), identifies the benefits of a workshop targeted towards cetaceans (sum of 75-100 days for all involved), method development and testing for birds (3-6 months), method development and testing for seals (requirements unknown at this stage), collation and review of supporting information for thematic overview, and national resources for implementation of relevant monitoring to provide longer-term data for the assessment.

Fish

The [workplan for fish](#) identifies improvements in the assessment of coastal fish communities that can be achieved by HOLAS III and possible approaches for planning towards assessments of demersal and pelagic fish using data available through ICES. Migratory fish are considered to be assessed in a similar way to HOLAS II, though improved coverage could be expected due to the availability of longer time series data (see pages 1-2 of workplan).

For coastal fish the improved assessment would apply an Ecological Assessment from Time Series (EATS-concept), including a better estimation of certainty of the assessment, for areas with suitable data, and a first assessment of status (trend-based approach) in additional areas. An initial assessment of size structure for a suite of key species would also be carried out in some of the areas.

The above work would also rely on the development of a regionally agreed list of relevant species.

The following possible resource issues were identified (see page 3 workplan). A workshop or meeting to further develop the details of the work plan (in particular for non-coastal fish aspects), indicator leads for any identified tasks (if not already covered), national resources to maintain progress under FISH PRO III, and potential resource implications for further cooperation with ICES.

Waterbirds

The [workplan for waterbirds](#) highlights proposals for improvement of the Abundance of waterbirds in the wintering season HELCOM indicator by the inclusion of available offshore data by HOLAS III and where possible incorporation of more data for both abundance indicators, inclusive of periods already assessed (improving the quality and confidence in the assessment). Furthermore, an aspect that will be improved within the indicators is the understanding and linkage between observed results/trends and the causative factors (see page 1-2 of workplan).

Other areas where ongoing work within JWG BIRD may contribute to future indicator development is relates to work on the breeding productivity of waterbirds and waterbird habitat quality. Both aspects are likely to represent longer-term work but should also be able to offer initial assessments or supporting contextual information by HOALS III to improve the overall assessment of waterbirds in the Baltic Sea region.

Resource issues (addressed on page 2 of workplan) include gathering sufficient data for offshore species at a scale and frequency to provide a high confidence assessment, maintenance and improvement of the scale and level of data collected nationally for the current indicators (e.g. coastal assessments), and improved data flows.

Marine mammals

The [workplan for marine mammals](#) defines a similar assessment of seal distribution and abundance in HOLAS III, with further expansion of the spatial data coverage for grey seal reproductive and nutritional status indicators (and likely inclusion of improved data input for other species).

For the harbour porpoise abundance assessment and distribution assessment it is proposed that key sites as well as management unit level surveys will be used, with data from the latter likely being available for HOLAS

III and the application threshold values being a good possibility. It may also be possible to make an initial assessment or review of supporting information related to harbour porpoise reproductive rate, though assessing condition of harbour porpoises is considered to be a longer-term work strand.

Habitat quality for marine mammals was reviewed, based on the request from the First HELCOM Indicator Workshop, though this topic is reflected in the HELCOM Science and Research needs and considered to be a longer-term area of development, though supporting information may be viable to bring an improved context to the thematic assessment at HOLAS III. These aspects are covered on page 1-2 of the work plan.

To provide a solid initial assessment of harbour porpoise abundance and distribution resource needs of 30,000 euros were identified to cover 3 months of modelling work. To further develop the nutritional status of grey seals indicator to cover the entire Baltic Sea region is estimated to be 50,000 euros, and compiling a comprehensive overview of harbour porpoise data to support the development of an optimal monitoring programme is estimated to be 80,000 euros. Other aspects are reflected in longer-term work within the HELCOM Science and Research needs process. Resource issues are presented on page 2 of the work plan.

Pelagic habitats

The [work plan for pelagic habitats](#) identifies two indicators that should be optimised and fully operationalised for HOALS III, the Seasonal succession of dominating phytoplankton groups and Zooplankton mean size and total stock HELCOM indicators. The approach would encourage more scientifically stringent testing of the two indicators and improved linkages between them.

Improving the data flows, in particular the use of HELCOM COMBINE, and solving issues related to reporting and extracting data was considered an important step in the process. Considering a tied approach to pelagic habitats similar to what is used in OSPAR, looking at nested levels of biological organisation (e.g. community, function and diversity) was also raised as an aspect that could be explored during HOLAS III with a view to longer-term development. The above aspects are covered in greater detail on pages 2-3 of the workplan.

Resources to operationalise the indicators were considered to amount to 3 months dedicated work time, with support from responsible national contact persons for relevant aspects of the process. A dedicated period of 6 months was also estimated to initiate development of an indicator linking between pelagic habitats and eutrophication. These aspects are considered on page 3 of the workplan.

Benthic habitats

The [work plan for benthic habitats](#) identifies a number of development issues that are potentially problematic and may require further discussion, for example within EN BENTHIC, to develop common regional approaches. Additionally the cooperation with the EU TG Seabed process and the specific timing of that process were raised as valuable though potentially not entirely compatible. For example, the possibility to raise issues at TG Seabed was considered important, though the plans for developments within that group (e.g. of methodologies and threshold values) by the end of 2021 were not seen are fully aligned with the planned autumn 2021 deadline for HELCOM indicator development work to have been completed.

It was proposed that a spatial assessment of physical loss and disturbance of the seabed could be achieved by HOLAS III, as a minimum by utilising the approach applied in HOLAS II, though with added effort to fill data gaps. It was also considered feasible to complete the development of the Cumulative impacts on benthic biotopes indicator for application in HOLAS III, though further expansion to include biotopes across the region and also develop suitable test cases should be explored and confirmed.

Other components were considered to be intertwined with the ongoing EU TG Seabed work and should likely be developed in a longer-term perspective with direct exchange and communication between TG Seabed and relevant national experts that are also involved in HELCOM. The above aspects are reflected in greater detail on pages 1-5 of the work plan.

Resource aspects (as reflected in greater detail on page 6 of the workplan) included: national support for increased coverage of the cumulative impacts on benthic biotopes indicator (including sensitivities), update data and pressure layers (maps) for HOALS III assessment supported by loss and disturbance data (e.g. data collection as carried out in TAPAS project), improved or updated broad habitat maps, case studies on pressure-response, a designated workshop to examine the approach for overall benthic habitat assessment (e.g. application of MSFD D6C5), and a designated research project to identify the optimal approach to assess adverse effects on the state of biotopes.

Hazardous substances

The [hazardous substances work plan](#) proposes the development of an indicator for copper, improvements to the diclofenac indicator assessment, fully operationalising and core status of the TBT and Imposex indicator, and the relevant adjustment to the calculation and integration processes (e.g. MIME and CHASE scripts). A review of threshold values and the supporting parameters applied are also considered as vital steps towards an improved assessment by HOLAS III.

Other improvements, for example building a descriptive link between inputs and state are also seen as important aspects for progress by HOALS III. Furthermore, developing supporting information that will be vital in placing the indicator assessments into a scientifically and ecologically relevant context is considered as an important aspect. The above issues are covered in greater detail on pages 1-3 of the workplan.

Resource issues were discussed (see page 4 of workplan) and one issue of major importance was identified, since the work is not possible within EN-HZ, which was the practical adjustment and update of the MIME and CHASE evaluation tools to accommodate the new developments (rough estimate of 8-12,000 euros). Other resource issues included identifying a lead for the diclofenac indicator, the planning of a meeting to evaluate appropriate ways to develop pressure-state linkages, support for a workshop on biological effects, and short projects (multiple, circa 3-6 months) to support the review of other components that will provide important contextual information by HOLAS III. A longer-term project for assessing optimisation of monitoring (circa 18 months) and the possible expansion of the oil spills indicator (resources not evaluated) were also discussed.

Marine Litter

The [marine litter workplan](#) addresses the need for cooperation with EU TG Marine Litter processes and the potential to operationalise indicators for an improved regional assessment by HOLAS III. An operational beach litter indicator is anticipated, though work is required to harmonise information and cooperation with EU TG ML regarding threshold values will be important. An improved assessment of seafloor litter, in particular in areas where monitoring already exists should also be possible by HOLAS III, potentially threshold values may also be derived within the HELCOM timetable via cooperation with EU TG ML. For microlitter development of indicators is at a much earlier stage, though it is considered possible that supporting information and a review of available information would be viable in HOLAS III to provide a broader overview of the topic. In all cases the further development of harmonised monitoring and assessment guidelines was considered important. More detailed information is provided on pages 2-3 of the workplan.

The resource issues are highlighted on page 4 of the work plan and include the need for maintain high priority for the topic and good national/regional representation in the Expert Group meetings. The resource needs identified include: one week per national expert to update macrolitter monitoring guidelines, where possible common persons representing HELCOM Contracting Parties in multiple processes to provide direct information exchange, possibility to explore a joint working forum between OSPAR-HELCOM-ICES, cooperation with EU TG ML to define threshold values, finalization of method to harmonize historic data (1-2 weeks for members of a dedicated sub-group), as well as several longer-term development aspects.

Underwater noise

The [workplan for underwater noise](#) covers the two existing indicators, impulsive noise and continuous noise. Impulsive noise can be further developed and potentially fully operationalised by HOLAS III. Maintaining and

increasing the reporting of data to the noise registry will be one critical component, and the finalisation of threshold values will be another. Further development of the continuous noise indicator is also anticipated, including the ongoing development of the soundscape planning tool, though once that is complete it will be important to develop new soundscape maps that are relevant for the assessment to be carried out. Further information is provided on pages 1-2 of the workplan.

Resource issues are addressed on page 3 of the workplan, with the following items noted as having potential resource implications. National resource issues for effective and full reporting to the noise registry, and the development of new soundscape maps for HOALS III and in the future (a previous estimate has been presented to State and Conservation 8-2018 ([document 3MA-5, table 4](#))).

Eutrophication

The [eutrophication workplan](#) covers areas for development by HOLAS III (and in the longer term) on pages 1-3. Aspects included are: further developing the shallow water oxygen indicator as an improved assessment by HOLAS III and full operationalisation likely being a longer-term aim, development of the chlorophyll-a spring bloom indicator, agreement on operationalisation of the cyanobacterial bloom indicator, agreement on target values for the total nutrient indicator in the Western Baltic Sea and Eastern Gotland Basin, improving confidence rating and scaling within the assessment of indicators, an improve the grouping of indicators and assessment rules, improved pressure-state linkages and linkages to benthic and pelagic habitats, possible division of selected assessment units (Gulf of Finland, Bornholm Basin), and discussion to decide how to assess eutrophication in coastal waters.

The major resource issues identified are related to supporting the functionality of the Expert Group to provide good ways for national experts to attend and prepare, to support national experts taking part in common forums and thus sharing information between relevant groups and relevant national projects, and to support an annual physical meeting of the Expert Group.

Resources related to the development of the shallow water oxygen indicator to expand the approach through modelling would be needed (but needs further discussion in IN Eutrophication first) and similarly to further develop the chlorophyll-a spring bloom indicator. Longer-term resources needs are also considered important for full development and operationalisation of the shallow water oxygen indicator and potentially revisiting the target setting approach (TAGREV). Greater detail is provided on pages 3-4 of the workplan.

Foodwebs

The discussion, as represented in the [workplan for foodwebs](#), on this topic was considered to be important, though at an early stage. It was considered important to further develop this topic during HOLAS III to both better reflect the issue descriptively in the report but also to set the foundations for future work.

The following proposals were discussed that would have likely resource consequences: the establishment of a CG FOODWEB (gathering existing expertise from separate species of habitat expert groups), gathering of available relevant information on the topic, carrying out a workshop in 2020 to review available information and collaborate with OSPAR to learn from test studies carried out, and developing Baltic Sea specific test studies in 2021.

Eutrophication-Biodiversity

The workplan for [Biodiversity-Eutrophication linkages](#) results from initial discussions that took place at the Second HELCOM indicator workshop. The workshop considered the topics discussed and the broaching of the subject of interlinkages across themes as highly valuable and recommended that such aspects be further developed, particularly during the HOALS III process. Considering such aspects during a thematic step-wise process in HOLAS III should result in an improved common understanding across themes and thus an improved holistic assessment overall.

Linkages with benthic habitats were considered between the two oxygen indicators (oxygen debt and shallow water oxygen) and the soft-bottom macrofauna community indicator, between coastal fish and eutrophication, and between birds and eutrophication. The application of a 'warning' approach in the bird abundance indicators (e.g. flagging species that also increase in abundance by over 30%) and the application of upper limit threshold values for cyprinid fish were discussed with relevance to eutrophication. These aspects were considered as important to clearly reflect where possible in HOLAS III.

Two indicator approaches to build on interlinkages between eutrophication and pelagic habitats/foodwebs were also discussed, including that the data required for these may be widely available through existing national monitoring efforts. Development and application of these would likely require resources such as to initiate data calls and for indicator leads to carry out the evaluation.

Biodiversity-Pollution

This work plan for [Biodiversity-Pollution linkages](#) results from initial discussion that took place at the Second HELCOM Indicator workshop. The Workshop considered that discussions were at a very early stage but that it was important to build on the platform established, particularly during HOLAS II, and that thematic workshops during the HOLAS III process would enable continued development with a particular focus on enhancing the scientific and ecological relevance of the thematic assessments and summary report.

The linkage between mammals-noise, litter-biota (e.g. birds) and hazardous substances-marine mammals (e.g. via existing health indicators) were all identified as aspects that could be reflected as contextual information in HOLAS III. Some aspects would likely need data calls to support a good regional overview at HOLAS III.