



Document title	Draft recommendation on management of internal nutrient reserves
Code	4-1
Category	CMNT
Agenda Item	4 - Risk assessment framework for internal nutrients reserves measurements
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Submitted by	Secretariat
Reference	

Background

The ad hoc Group MINUTS continued its work on the development of the regional principles and risk assessment framework for the management of internal nutrient reserves in accordance with the guidance given by PRESSURE 11-2019. An initial draft of the Recommendation on the application of sea-based measures to manage internal nutrient reserves was significantly advanced. In particular: the purpose of the recommendation was specified, the policy relevance in the preamble was improved, and the definition of sea-based measures and regional principles was advanced. The group worked a lot to propose transparent and relatively simple procedures to consider the application of sea-based measures, tailored for three different categories of measures (chemical, physical and biological measures). The aim is to exclude excessive bureaucratic procedures but assure necessary risk mitigation and efficient information and knowledge exchange.

Nonetheless, the draft still contains a number of open issues that require further consideration and guidance from WG PRESSURE. These issues are the following:

- 1) The applicability of the precautionary principle to sea-based measures is ambiguous as it requires Contracting Parties to proceed with measures despite incomplete knowledge, but also to act with caution when intervening in the marine environment.
- 2) HELCOM's role in the consideration of sea-based measures requires further clarification. For small-scale measures without transboundary effects, it is proposed that the focus is on guiding national permitting procedure and an effective knowledge exchange while large-scale measures with likely transboundary effects require adequate risk mitigation procedures in addition.
- 3) The possible mechanisms for incorporation of the proposed risk mitigation procedure in national permitting systems and the role of HELCOM and the relevant HELCOM Working Group in this process requires clarification.

Germany also expressed the opinion that it is in favor of restricting the Recommendation to research activities to manage internal nutrient reserves until a sound scientific knowledge base is developed and to include a prohibition of all other activities including commercial applications.

This document includes 2 Attachments. Attachment 1 is a clean version of the draft HELCOM Recommendation on the application of sea-based measures to manage internal nutrient reserves with a couple of remaining comments.

Attachment 2 is an initial draft of the Guideline submitted as background information but not for consideration in the meeting since it is not yet sufficiently developed. The Guideline is planned to be further

developed and submitted to PRESSURE 13-2020 for endorsement. Meanwhile, Contracting Parties might be interested in an intersessional commenting round to contribute to the drafting of the Guideline.

Action requested

The Meeting is invited to consider the draft Recommendation, exchange views on the key open issues identified in this cover note and propose further steps to advance the development of the risk assessment framework.

The Meeting also invited to agree on the intersessional procedure to comment on the draft Guideline for the management of internal nutrient reserves in the Baltic Sea region.

DRAFT HELCOM RECOMMENDATION XX/X

Adopted XX.XX.20XX,
having regard to Article 3, Paragraph 1
of the Helsinki Convention

ON APPLICATION OF SEA-BASED MEASURES TO MANAGE INTERNAL NUTRIENT RESERVES

THE COMMISSION,

BEING CONCERNED ~~of by~~ the sustained highly eutrophic state of the Baltic Sea despite efforts of the Contracting Parties to the Helsinki Convention to reduce the nutrient load to the Baltic Sea from external sources and despite jointly achieved progress towards maximum allowable inputs of nutrients identified by the Baltic Sea Action Plan;

BEING ALSO AWARE that reduction of the nutrient input from external, predominantly, land-based sources of highest priority as the maximum allowable input of nutrients ~~have has~~ not yet been achieved for all Baltic Sea sub-basins and that national ceilings for net nutrient inputs have not yet been reached by all countries and other contributors. ~~and being aware that this makes reduction of the nutrient input from external, predominantly, land-based sources of highest priority;~~

RECOGNIZING with concern that large amounts of nutrients have accumulated in the Baltic Sea during the past decades due to anthropogenic activities, preventing the sediments from acting as an sufficiently effective nutrient sink ~~by~~ resulting in an enhanced internal flux of nutrients between sediments and sea water, thereby exacerbating eutrophication and delaying recovery;

NOTING scientific and technological progress in the development of measures to manage nutrient reserves ~~accumulated that have accumulated~~ in the Baltic Sea, due to sustained high anthropogenic nutrient inputs;

BUT BEING CONCERNED about the scarcity of scientific evidence regarding the sustainability of the effects of such measures and their potential harmful consequences for the marine environment, including potential transboundary effects in case of large-scale application of such measures;

RECALLING Paragraphs 1 and 2 of Article 3 and 1b of the Article 20 of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992, (Helsinki Convention), obliging Contracting Parties to take, individually or jointly, all appropriate legislative, administrative or other relevant measures to prevent and eliminate pollution in order to promote the ecological restoration of the Baltic Sea Area and the preservation of its ecological balance including applying the precautionary principle as well as making related recommendations;

RECALLING ALSO the United Nations Convention on the Law of the Sea and its obligations for States to protect and preserve the marine environment (Art 192) including to take measures to prevent, reduce and control pollution (Art 194) and not to transfer damage or hazards or transform one type of pollution into another (Art 195);

RECALLING FURTHER Resolution LP.4(8) on the Amendment to the London Protocol to Regulate the Placement of Matter for Ocean Fertilization and Other Marine Geoengineering Activities that provides an assessment framework for scientific research involving ocean fertilization and a general assessment framework for marine geoengineering activities;

RECALLING ALSO the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) obliging the signatories to the Convention to assess the environmental impact of certain activities at an early stage of planning and notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries and recalling similar obligations under the EU Environmental Impact Assessment Directive 2001/42/EC.

HAVING REGARD that the HELCOM Brussels Ministerial Declaration 2018 foresees a stepwise approach to the management of internal nutrient reserves, encouraging Contracting Parties to the Helsinki Convention as a first step to improve the knowledge base regarding the nature and dynamics of internal nutrient reserves and, as a second step, to undertake research on the potential of ~~sea-based~~ measures to manage internal nutrient reserves as well as to develop and apply a risk assessment framework in HELCOM to meet the necessary environmental requirements, including commonly agreed regional principles as guidance for internal nutrient reserves management;

REAFFIRMING the statement of the HELCOM Brussels Ministerial Declaration 2018 that the risks to ecosystem and human health stemming from ~~sea-based~~ measures to manage internal nutrient reserves, as well as the long-term sustainability of their effects, need to be considered and thoroughly evaluated;

TAKING INTO ACCOUNT the requirements of the EU Water Framework Directive 2000/60/EG and the EU Marine Strategy Framework Directive 2008/56/EC ~~to achieve or maintain good ecological status/good environmental status and rules aimed at preventing environmental degradation, Recalling in this context in particular the Weser case and the ruling of the Court of Justice of the European Union that any activity that will lead to deterioration, even on a temporary basis, shall be prohibited in accordance with the non-deterioration rule.~~

~~the EU Maritime Spatial Planning Directive 2014/89/EU,~~ and related national legal acts of the EU member states, Federal Laws on Environmental Impact Assessment and on Internal Sea Waters, Territorial Sea and Contiguous Zone of the Russian Federation which aim to achieve or maintain good ecological status/good environmental status and prevent environmental degradation;

RECALLING the European Union Court of Justice ruling that any activity that leads to deterioration, even on a temporary basis, shall be prohibited (the Weser case).

NOTING that in the context of this Recommendation measures to manage internal nutrient reserves are hereafter called sea-based measures. Such sea-based measures include but are not limited to the following: chemical measures, such as enabling the sediment to sequester nutrients by oxygenation (for example bottom water oxygenation); physical measures such as removal of nutrient rich sediments (for example substance addition or sediment removal); and biological measures such as the removal of organisms (for example extractive aquaculture, microbial manipulation, removal of fish without significant economic value).

NOTING that the provisions of this Recommendation shall not prejudice stricter provisions concerning the application of sea-based measures contained in other, existing or future, national, regional or international instruments;

RECOGNIZING with concern that the precautionary principle of the Helsinki Convention in the case of sea-based measures both requires Contracting Parties to proceed with measures despite incomplete knowledge, but also to act with caution when intervening in the marine environment.

EMPHASIZING that this Recommendation is intended to prevent potential adverse effects of sea-based measures on the Baltic Sea marine environment, to mitigate their risks and to ensure the sustainability of

Commented [DF1]: application of precautionary principle requires further clarification

desired effects through thorough planning and comprehensive and transparent national permitting procedures;

NOTING that this Recommendation is intended to facilitate the development of the knowledge base related to ~~manipulation of the marine environment~~ sea-based measures in order to mitigate eutrophication of the Baltic Sea;

~~**RECOMMENDS** to the Governments of Contracting Parties to the Helsinki Convention to consider all activities (including commercial and research projects) intended to reduce or prevent the release of legacy nutrients as management of internal nutrient reserves of the Baltic Sea (hereafter called sea-based measures³). These are strictly intended to complement measures intended to limit the introduction of additional nutrients from land, air and maritime sources;~~

RECOMMENDS to the Governments of the Contracting Parties to the Helsinki Convention to assess and control sea-based measures in the Baltic Sea including private, commercial and research projects through national permitting procedures;

FURTHER RECOMMENDS that the Contracting Parties apply the HELCOM Guidelines for the management of internal nutrient reserves (hereafter called HELCOM Guidelines) in the Baltic Sea region in the permitting procedure. ~~Furthermore, HELCOM Contracting Parties which are planning such sea-based measures should bring information on the planned measures, described in the HELCOM Guideline, to consideration of relevant HELCOM Working Group(s) in order to ensure that:~~

- ~~- they serve to achieve a Baltic Sea unaffected by eutrophication and that positive effects of the measures will be sustained even after the measures are completed;~~
- ~~- they do not cause significant irreversible adverse effect on the environment and~~
- ~~- environmental risks are minimized.~~

RECOMMENDS that, concerning **sea-based measures which are conducted in coastal waters and considered unlikely to affect the waters of more than one HELCOM Contracting Party**, the Contracting Parties assess and control these in accordance with the requirements of the HELCOM Guidelines part a) in national legislation and permitting requirements/procedures. ~~and inform the relevant the HELCOM working group of the results of any measures and associated post project appraisal in order to improve the regional knowledge base, and assess and control;~~

ALSO RECOMMENDS that, concerning **sea-based measures which are conducted in coastal waters and could potentially significantly affect the waters of more than one HELCOM Contracting Party**, the Contracting Parties assess and control these in accordance with the requirements of the HELCOM Guidelines part b) of the HELCOM Guidelines in national permitting procedures;

FURTHER RECOMMENDS that, concerning **sea-based measures which are conducted in the open sea by one or more HELCOM Contracting Parties and which potentially significantly affect the waters of more than one HELCOM Contracting Party**, the Contracting Parties assess and control these in accordance with the requirements of the HELCOM Guidelines part b) in accordance with the requirements of the HELCOM Guidelines [in national permitting procedures].

Commented [DF2]: To define further whether this is valid even for small scale measures.

Furthermore, HELCOM Contracting Parties which are planning such sea-based measures should bring information on the planned measures, described in the HELCOM Guideline, to consideration of relevant HELCOM Working Group(s) in order to ensure that:

- ~~— they do not cause significant irreversible adverse effect on the environment;~~
- ~~—~~
- ~~— risks are minimized, and~~
- ~~positive effect of the measures will sustain.~~

RECOMMENDS that in the national permitting procedures, Contracting Parties consider the conclusion of HELCOM, as to whether the sea-based measure in the open sea and any other measures with potentially significant transboundary effects ~~can~~should be conducted and whether further information or modifications are necessary to minimize the risk for the Baltic Sea environment. The conclusion HELCOM takes is based on the information and in accordance with the procedure described in the Guidelines part b)., ~~is considered in the national permitting procedure.~~

RECOMMENDS to the Governments of the Contracting Parties to the Helsinki Convention to apply the following regional principles when planning and applying sea-based measures:

- ~~the ultimate goal of the~~ sea-based measures should ~~be to~~ contribute to the achievement of a Baltic Sea unaffected by eutrophication~~good environmental status of the Baltic Sea;~~
- ~~sea-based measures do not substitute measures to reduce nutrient inputs to the Baltic Sea from land, air or maritime sources and cannot therefore be accounted for as national nutrient input reduction measures in the context of the nutrient input ceilings agreed in the Baltic Sea Action Plan;~~
- ~~input of nutrients from external sources should be reduced to the input ceilings agreed in the Baltic Sea Action Plan before application of sea-based measures to achieve a sustainable reduction of nutrient concentrations;~~
- ~~the application of~~ sea-based measures should not lead to ~~any~~ deterioration of the marine environment;
- the precautionary principle should be applied when assessing and controlling sea-based measures;
- ~~— sea-based measures cannot substitute measures to reduce nutrient inputs to the Baltic Sea from land, air or maritime sources and cannot therefore be accounted for as national nutrient input reduction measures in the context of the nutrient input ceilings agreed in the Baltic Sea Action Plan;~~
- ~~— input of nutrients from external sources should be reduced to the input ceilings agreed in the Baltic Sea Action Plan before application of sea-based measures to achieve a sustainable reduction of nutrient concentrations;;~~
- measures should be based on the best available scientific knowledge;
- ~~— large scale measures cannot be applied without preliminary testing oin smaller scale;~~
- ~~— the HELCOM Guidelines are intended as to guide national permitting procedures ensuring environmental impact assessments are comprehensive and informative;~~

- the environmental effects of sea-based measures should, ~~as far as feasible,~~ be monitored for the duration they are expected to effect on the marine environment.;
- information provided on sea-based measures for national permitting procedures and within the HELCOM guidelines needs to demonstrate compliance with these regional principles.

RECOMMENDS ALSO to apply the principles and the HELCOM Guideline when international and national financial institutions, private investors, research organizations and commercial organizations plan any activities related to management of internal nutrient reserves;

RECOMMENDS ALSO to the Contracting Parties to facilitate development of the regional knowledge base through:

- national research programmes to develop the scientific knowledge base on nutrient fluxes in the marine environment, factors affecting their character and methods to manage internal nutrient reserves, including risks which these methods can pose to the environment;
- exchange of information on recent research and results of testing of sea-based measures in the Baltic Sea region;
- enhanced international cooperation with the aim to transfer and develop the best available techniques and practices regarding sea-based measures to mitigate eutrophication; including this HELCOM recommendation and the HELCOM Guidelines;
- engaging in dialogue and enhanced cooperation with business and industry, sea users, local communities and other relevant civil society groups as well as national stakeholders focusing on application of sea-based measures to mitigate eutrophication;

RECOMMENDS to organize reporting on this Recommendation in accordance with the HELCOM Guidelines.

RECOMMENDS to review this recommendation and the HELCOM Guidelines ~~within three~~ five years and thereafter as necessary when new scientific knowledge is available.

Annex 1 Glossary

For the purpose of this Recommendation the terms listed below have been defined as follows:

Internal nutrient reserves	Nutrients stored currently in the water column, the sediments or in marine biota and that have accumulated over time in the past due to excessive external anthropogenic nutrient inputs
Coastal waters	Waters extending at most 1 nautical mile from the baseline (usually the mean low-water mark) of a coastal state
Open sea	All waters extending beyond 1 nautical mile from the baseline (usually the mean low-water mark) of a coastal state
Transboundary effects	Effects on the marine environment that involve the national waters of more than one Contracting Party
Large-scale measures	
?	
Management of internal nutrient reserves	
?	

Commented [LA3]: Offshore? I should know this, but is Open sea the accepted terminology?

Commented [LDW4R3]: At least we have used the term "open sea" in the 2018 Ministerial Declaration and since we refer to this the term was introduced here

Commented [LA5]: Specifically, is this EEZ, or something else. Reccomend that this is widened to EEZ.

Commented [LDW6R5]: This includes territorial waters (1-12nm) and EZZ (>12nm) and would theoreticall also include waters beyond national juristicition outside EEZ but those do not exist in the Baltic Sea

Commented [LA7]: Propose we remove, and do not use the term in the text

Commented [LA8]: Propose we remove

Guidelines for sea-based measures to manage internal nutrient reserves in the Baltic Sea region

Rationale

As most cost-effective eutrophication abatement measures have already been implemented e.g. in wastewater treatment, there is an increasing interest in sea-based measures¹ to improve local water quality in the Baltic Sea. It has also been brought to discussion that to reach international targets on reducing eutrophication in the Baltic Sea (HELCOM BSAP, EU MSFD, EU WFD, SBSR), new activities may be needed to tackle the internal nutrient sources to complement traditional land-based load reduction measures.

Sea-based measures should not be directly applied by public, private or third sector actors, as most of the ideas are novel and have not been applied before in the marine environment. Single measures have been tested regionally in pilot projects, but large-scale deployment of such measures has not yet been considered. Applicability of specific measures is often site-specific and to gain comparable information, the measures would need to be piloted in different scales, regions and sea areas.

These guidelines are designed for HELCOM Contracting Parties to evaluate proposed activities for conducting sea-based measures to manage internal nutrient reserves, keeping in mind that the deployment of such measures should be carefully considered in view of the potential risks they pose and that sea-based measures are always secondary to measures to control external loads in the catchment. In order to prevent eutrophication in the long term, the external nutrient load must be sustainable; only then can internal load management, in certain situations, lead to or speed up recovery.

Application of the guidelines

Contracting Parties should follow these guidelines in accordance with the HELCOM Recommendation XX/X on the application of sea-based measures to manage internal nutrient reserves.

The guidelines are intended to (complement) provide additional information to national and international decision making. National authorities should take these guidelines into account when conducting environmental permitting. Thus, these guidelines should be brought to the attention of national permitting authorities, who should encourage their use by applicants of permits. The aim of these guidelines is to provide guidance for operators and environmental managers aiming to carry out activities designed to reduce the internal nutrient reserves in coastal waters. The guidelines also provide decision support for relevant authorities when conducting consultations and permitting related to sea-based measures.

The guidelines also encourage the exchange of information on sea-based activities to manage internal nutrient reserves between HELCOM Contracting Parties.

The guidelines are composed of two parts. Part I should be applied to measures which are not planned for the open sea and any other measures, which do not have potentially significant transboundary effects. These measures are referred to as Small-scale measures. Part II should be applied to measures planned for the open sea and any other measures having potentially significant transboundary effects. These measures are referred to as Large-scale measures.

Part I - Small-scale measures

¹ Sea-based measures intend to reduce or prevent the release of nutrients from internal sources to the water column. The measures aim to manage the legacy nutrients stored in the Baltic Sea in contrast to measures aimed to limit the introduction of additional nutrients from land, air and maritime sources. Sea-based measures include, but are not limited to, the following: Chemical measures, such as enabling the sediment to sequester nutrients; physical measures such as removal of nutrient rich sediments; and biological measures such as removal or farming of organisms.

The following matters are relevant when planning small-scale measures in the Baltic Sea region. Some matters listed below may not be of significance for all activities; all relevant matters should be considered with focus on the assessment of ecological risks.

1. GENERAL DESCRIPTION AND OBJECTIVE OF THE ACTIVITY

- *Common summary needed?*
- Detailed description of the problem in the area
- Description of affecting mechanism of activity
- Effectiveness, what is the target status of the area after activity put into practice
 - o *How is this measured prior to the activity?*
 - o *The question might not be equal to all activities.*

2. IMPLEMENTATION

- Description of the feasibility and suitability of the activity (*How is this measured in case of novel techniques?*)
- Mode of action of measure (chemical, biological, physical)
- References of the activity when available, suitability of technique chosen
- Duration of the activity including operational and monitoring periods

3. SCALE

- Scale of area where activity will be applied and where the activity will be detectable

4. ECOLOGICAL EFFECTS

- Describe expected results – target for manipulation and potential collateral non-target effects

5. DESCRIPTION OF SITE(S)

- Principles of site selection
- Level of knowledge on the target system (pre-condition, available monitoring data etc.)
- Picture the area to be managed (water depths, surface area, volumes, quality of water, quality of sediment, water exchange)
 - o Semi-enclosed bay, fjords, fladas.
 - o Justification of selected site
- Find out and inform water area owners (*any other relevant ownership issues?*)
- Possible effects on the general use of the manipulated area

6. SPATIO-TEMPORAL MONITORING

- Expected areal coverage and influencing time is the basis for comprehensive monitoring
- Introduction of possible reference area
- Monitoring
 - o physical
 - o chemical
 - o biological

7. SOCIO-ECONOMIC ANALYSIS

A short description on the economic and social impact of the project should be provided. The analysis should include information and the cost efficiency of the selected measure as well as the added value it would bring. In addition, a short communication strategy containing information on how local people and the general public will be informed on and heard throughout the activity should be included.

8. ENVIRONMENTAL ASSESSMENT

- Environmental impacts & risks (risk assessment framework)
- Risk management & monitoring (planning & implementation)
- HELCOM indicators and thresholds can be used in risk assessment
- Energy use
- Waste produced
- Alternative proposals
 - o Motivation of chosen method
 - o Justification of location
 - o Magnitude of work
 - o Alternatives
- Environmental conditions
- Activities to minimize negative effects
- Activities to achieve environmental targets
- Summary of consultation procedures
- Accident preparations
- Measurement programme
- Impact on Natura 2000 and HELCOM MPAs

9. REPORTING

- Reporting for authorities on observed impacts of activity on the marine environment
- *Evaluation of reporting?*

10. FUNDING SOURCES

The funding sources of the activity (e.g. public or private funding) and the estimated budget of the activity should be provided.

- *QUESTION: What if funding is not open information?*

11. PARTICIPATING INSTITUTES AND COMPANIES

Information regarding the principal project team and their affiliations, including any associated authorities/institutes/companies should be provided. The responsible legal authority should also be provided.

12. WORK PLAN

A general project plan on management and implementation of the activity should be developed. The plan should address the different steps/phases of the activity and include a time schedule, objectives of the project and possible constraints related to the project..

13. COMMITMENT TO INFORM HELCOM OF THE RESULTS

- Responsible parties should inform HELCOM PRESSURE and other relevant HELCOM groups of results
- *Should we develop a form to be filled of the results of the experiment after finishing the experiment?*

Part II - Large-scale measures

The following matters are relevant when planning large-scale measures in the Baltic Sea region. Some matters listed below may not be of significance for all activities; all relevant matters should be considered with focus on the assessment of ecological risks.

1. GENERAL DESCRIPTION AND OBJECTIVE OF THE ACTIVITY

This section contains a short description of the activities including:

- a description of the mechanism of how the project intends to manage internal nutrient reserves
- the mode of action of the measure (chemical, biological, physical)
- its feasibility and effectiveness
- the location
- the duration
- expected results

2. INITIAL ASSESSMENT

The initial assessment clarifies whether a proposed activity falls under the definition of recommendation XX/X and therefore needs to be assessed following these guidelines.

A proposed activity needs to have the following properties to be considered for an assessment according to these guidelines:

- any deliberate human intervention in coastal waters and the open sea with the main purpose [primary aim] to mitigate eutrophication and its symptoms through the physical, chemical or biological manipulation of nutrient fluxes
- such intervention needs to have the potential to result in widespread, long lasting or severe effects in the marine environment

3. ENVIRONMENTAL ASSESSMENT

3.1. SITE SELECTION AND DESCRIPTION

This section concerns the provision of data necessary for HELCOM Contracting Parties to evaluate the physical, geological, chemical and biological conditions at the proposed site, and the uncertainties in the conditions in relation to the proposed activity.

A rationale for choosing the proposed site(s) should be provided, based on the following key goals:

- a) suitability for applying a specific measure to manage internal nutrient reserves;
- b) suitability for minimizing undesirable effects; and
- c) avoiding proximity to areas of special concern and value (e.g. NATURA 2000, HELCOM MPAs)
- d) avoiding interference with other anthropogenic activities/uses of the sea

The site selection should include the coordinates of the proposed site and the coordinates of the region of potential impact (the area of the sea in which detectable positive or negative changes (effects) occur as a result of the activity), stating explicitly whether this also covers the waters of other HELCOM Contracting Parties other than the Contracting Party responsible for conducting the activity.

The site selection should address the relevant physical characteristics of the region of potential impact including the following:

- general characteristics (coastal and open waters, semi-enclosed bay)
- water column characteristics (depth, horizontal and vertical temperature and salinity distribution)
- characteristics of bottom geology
- transport and mixing characteristics (intensity of mixing, currents, exchange regime with surrounding media including the atmosphere)
- meteorology (temporal/seasonal conditions, winds, waves)

- biological and ecological characteristics (benthic and pelagic habitats, sensitive/protected/vulnerable/endemic/migratory species, vulnerable ecosystems, areas of special concern/value e.g. NATURA 2000, HELCOM MPAs)
- proximity to other uses of the sea (e.g. fishing, navigation, engineering uses etc.)

3.2. ASSESSMENT OF MATTER [SUBSTANCES] TO BE PLACED INTO THE MARINE ENVIRONMENT [EXPOSURE ASSESSMENT]

If the activity to manage internal nutrient reserves involves the placement of matter [substances] into the marine environment their properties and fate need to be assessed. Uncertainties associated with such an assessment also need to be identified.

The characterization and assessment of matter [substances] to be placed into the marine environment should account the following:

- mode of application/method of delivery (including hazards due to ship operations or structures to be located at sea and hazards if the substance reaches an unintended area)
- origin, total amount, form and average composition and fate
- chemical characterization of each substance (including solvents, chelators, tracers etc.) to be added or of artificially upwelled waters (hazardous properties, toxicity)
- physical characterization (form e.g. solid, liquid, particle size, concentration), depth in water column, rate of addition, area initially affected by the addition, total amount to be added, duration of the addition process, other impacts on or changes in the physical environment, advection to sensitive areas)
- biological characterization (intended or unintended transport of organisms)
- exposure processes and pathways including:
 - a) physical processes (e.g., currents, wind patterns, seasonal influences, settling, dispersion, re-suspension, subduction)
 - b) chemical processes (e.g., decomposition, transformation, coagulation)
 - c) biological processes (e.g., transformation, bioaccumulation, bio-magnification)
- other unintended impacts of the delivery method
- conflicts of the delivery method with other uses of the sea
- cumulative exposure from repeated activities
- possible alternatives for the substances used

3.3. ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS AND RISKS

The assessment of potential environmental effects should lead to a concise statement of the expected consequences of the activity within the area of the activity and within the area of potential impacts, including transboundary effects and cumulative effects. The assessment should specify the potential effects on the marine ecosystem structure and dynamics including sensitivity of species, populations, communities, habitats and processes. Effects on human health and on other legitimate uses of the sea should also be assessed. The assessment should define the nature, temporal and spatial scales and duration of expected impacts based on reasonably conservative assumptions. It provides the basis to approve, reject or suggest revisions to the proposed activity and for defining risk management and mitigation measures and environmental monitoring requirements. If this assessment reveals that adequate information is not available to determine the likely effects of the proposed activity then the activity should not be considered further.

The assessment of potential environmental effects should at least consider the following issues:

- geochemical changes and fluxes (e.g. nutrients, redox, pH, carbonate system etc.)
- organism responses
- ecosystem considerations (community composition and biodiversity, food-web interactions, potential for bioaccumulation and biomagnification of toxins or contaminants in organisms, potential for acute or chronic effects from toxins or contaminants)

- potential effects on HELCOM indicators
- human health considerations, including food chain effects
- impingement upon other uses of the sea
- cumulative impacts from interactions with other anthropogenic uses or from multiple projects/experiments
- potential alternatives

Methodologies for assessing effects (e.g. models, pre-existing data, targeted measurements) should be described, including the sensitivity to underpinning assumptions, uncertainties and data gaps (e.g. due to limited information on baseline conditions, natural variability, longevity of the response and lack of long-term monitoring in previous activities).

Risk is a function of the magnitude of an adverse effect (or its consequence) and its probability. For each of the negative environmental effects identified an estimation of the magnitude and probability should be provided. The integration of the magnitude of an effect and its probability will yield an estimation of risk based on a risk assessment matrix provided in Fig. 1 below. The estimation of magnitude and probability is semi-quantitative at best and will represent expert judgements based on the available knowledge and experience. The magnitude of an effect will need to consider the temporal and spatial scale of the effect. Conclusions regarding the likelihood for effects of a given magnitude are developed from evidence regarding the strength of relevant cause-and-effect relationships (e.g. as determined by the exposure and effects assessments under 3.2 and 3.3), uncertainties associated with these relationships and the role of natural variation in these processes in the environment.

Increasing acceptability ↘	Consequences			
	Severe	Moderate	Mild	Negligible
Probability				
High	High	High	Medium/Low	Very low
Medium	High	Medium	Low	Very low
Low	High/Medium	Medium/Low	Low	Very low
Negligible	High/Medium/Low	Medium/Low	Low	Very low

Fig.1 Risk assessment matrix integrating the probability and consequence (magnitude) of an effect, to be applied for each negative environmental effect.

In addition to assessing the risks of a activity the environmental assessment also needs to provide a description and summary of the uncertainties associated with its conclusions. Such a description is to include a listing of the significant/consequential assumptions, data gaps, and sources of variation in exposure and effect processes. The evaluation of uncertainties needs to be sufficient to inform decision-makers regarding the limitations and constraints associated with the risk conclusions, including the means for decision-makers to inform themselves about the implications for decision-making posed by those identified uncertainties. The estimation of uncertainty will also provide source of input for identifying monitoring and research activities through which uncertainties can be reduced and risk assessments can be supported. Because the

risk management decisions are based on predictions, monitoring should seek to test these predictions, so that environmental assessment can be improved.

4. RISK MANAGEMENT

5.

Risk management procedures are necessary to ensure that environmental risks of the activity are minimized through mitigation and contingency planning and the benefits maximized and that a precautionary approach is applied.

a. MITIGATION AND CONTINGENCY PLANNING

Risks should be managed to reduce them to a low level. Strategies to manage or mitigate risks need to be appropriate for the risks under consideration. They may be imposed as additional conditions by a HELCOM Contracting Party or included as an intrinsic part of the proposal. Such strategies include:

- a) temporal restrictions (e.g. during certain oceanographic conditions or biologically important times for species of concern)
- b) spatial restrictions (e.g. proximity to areas of special concern and value e.g. NATURA 2000, HELCOM MPAs, proximity to other uses)
- c) operational restrictions (e.g. substances or gear used, application techniques)

Contingency planning also needs to respond to the results of monitoring in cases where unexpected negative environmental effects occur. This may include the cessation of the activity.

b. MONITORING

A well-designed monitoring regime is necessary and should cover short and long-term impacts and, where possible, determine whether any unexpected negative environmental effects occur and whether the activity has achieved its purpose. The type, frequency and extent of monitoring will depend on the expected local and regional environmental impacts of the activity.

The monitoring plan should include:

- a) compliance monitoring to verify that permit conditions are met
- b) impact monitoring to determine the area of impact and to verify that the assumptions made during the assessment of the proposed activity were correct and sufficient to protect the marine environment. The monitoring should start prior to the activity to establish baseline conditions and should ideally cover control sites.

The design of the monitoring regime should be evaluated taking into account relevant research and modelling information and modifications can be requested.

6. SOCIO-ECONOMIC ANALYSIS

A short description on the economic and social impact of the project should be provided. The analysis should include information and the cost efficiency of the selected measure as well as the added value it would bring. In addition, a short communication strategy containing information on how local people and the general public will be informed on and heard throughout the activity should be included.

7. FUNDING SOURCES

The funding sources of the activity (e.g. public or private funding) and the budget of the activity should be provided. It should be stated whether there are any commercial interests in the project. It has to be demonstrated that the proposed activity has the financial resources available before it commences to fulfil the programme of work including permit conditions requiring e.g. mitigation, contingency planning and monitoring.

8. PARTICIPATING INSTITUTES AND COMPANIES

Information regarding the principal project team and their affiliations, including any associated authorities/institutes/companies should be provided. The responsible legal authority should also be provided.

9. WORK PLAN

A detailed project plan on management and implementation of the activity should be developed. The plan should address the different steps/phases of the activity and include a detailed time schedule, objectives of the project and possible constraints related to the project.

10. DECISION-MAKING AND REPORTING REQUIREMENTS

A decision that a activity can go ahead should only be made if the guidelines have been followed and all issues above have been satisfactorily completed and conditions are in place that ensure that environmental disturbance is minimized and environmental benefits maximized. In case that adequate information is not available the permitting authority should request additional information before taking a decision on issuing a permit.

The consultation requirements between HELCOM Contracting Parties need to be fulfilled in accordance with Recommendation XX/ X.

If the risks and/or uncertainties are so high as to be deemed unacceptable, with respect to the protection of the marine environment, taking into account the precautionary approach, then the permitting authority should make a decision to seek revision of or reject the proposal for the activity.

Authorization of the activity includes:

- the duration and location of the activity
- the methods to be used
- if relevant, the types and sources of matter or technical equipment to be placed
- risk management, monitoring and reporting requirements
- removal and/or disposal/reuse/recycling of items, as appropriate, at the end of the activity
- any other conditions required by HELCOM Contracting Parties.

This authorization should be communicated to the HELCOM Secretariat and WG PRESSURE and to countries in the region of potential impact.

A report of any results and impacts of the activity, including the results of monitoring, should be provided to the HELCOM secretariat and WG PRESSURE. Collection and use of information resulting from monitoring informs future decision making and can improve future assessments.

Permits should be reviewed at regular intervals by taking into account the results of monitoring, the objectives of the monitoring programme and relevant research. Review of monitoring results will indicate whether a activity needs to be continued, revised or terminated and will contribute to informed decisions regarding the continuance, modification or revocation of permits.

Literature

Vahanen (2018) "*SPEEDING UP THE ECOLOGICAL RECOVERY OF THE BALTIC SEA*" p 53.
Mäki, M. JNF Foundation. Guidelines for sea-based measures. DRAFT.

