Document title	Follow up of MARITIME 19A-2020
Code	3-10
Category	DEC
Agenda Item	3 - Update of the Baltic Sea Action Plan
Submission date	24.04.2020
Submitted by	Secretariat
Reference	Outcome of MARITIME 19A-2020

Background

The Intersessional on-line Meeting of the HELCOM Maritime Working Group (MARITIME 19A-2020) was held on 14-15 April 2020 in accordance with the decision of HELCOM MARITIME 19-2019. The Meeting was convened to further the work on existing actions and review proposals on new actions for the BSAP. The Outcome of the Meeting is available in the Meeting Portal. The Meeting was not able to finalize the technical review, and consequently a follow up online meeting will be organized. Based on the indicated dates of your preference such on-line meeting will be held on **28 April 2020, 10:00-16:00h EET**.

The aim of the Meeting will be to conclude on the technical review of the proposals for new BSAP actions initiated in MARITIME 19A-2020. The status of review of the synopsis of actions as agreed so far by MARITIME 19A-2020 is contained in Annex 3 of the Outcome of MARITIME 19A-2020. The Meeting will continue with the technical review taking into account the guidance in document 3-3 and utilising the Excel table as contained in document 3-8 Rev.2.

As requested by MARITIME 19A-2020 (para. 3.22 of the Outcome) Finland has provided a synopsis combining the three actions related to underwater noise, numbered 7, 9 and 10. This document also contains updated synopses for actions 2 and 5 proposed by Finland, which MARITIME 19A-2020 agreed should be split into two separate actions (para 3.21 of the Outcome). In addition, this document contains the synopsis to action 19 “Limit the discharge of cargo residues from shipping in the Baltic Sea (e.g. vegetable oil and fertilizers)” as provided by the Swedish Agency for Marine and Water Management.

To facilitate the discussion, this document contains the updated Excel table as contained in document 3-8 Rev.2 to be aligned with the decisions made by MARITIME 19A-2020 (and reflected in Annex 3 of the Outcome of the meeting) as well as the proposed change to the above mentioned underwater noise measures.

Action requested

The Meeting is invited to make use of the Excel table together with the guidance (document 3-3) for the technical review of the synopses on proposed new actions for the updated BSAP under Maritime.

Follow up of MARITIME 19A-2020

Actions to further reduce nutrient input of shipping into the Baltic Sea

Submitted by:

Finland

Description of measure

The Baltic Sea was the first sea area in the world to receive the status as a special area in MARPOL Annex IV (sewage) in 2016. Set to come into effect 1 June 2019 for new passenger ships, 1 June 2021 for existing passenger ships and in June 2023 for passenger ships entering the Baltic Sea in direct passage to the Russian ports in the eastern Gulf of Finland passenger ships, including cruise ships, will have to discharge sewage into port reception facilities or alternatively at sea only after treatment with very advanced on-board sewage treatment plants able to reduce nutrient input into the sea. However, these regulations for sewage discharges still apply only for passenger ships.

As the Contracting Parties have unanimously stated i.e. during negotiations to regulate sewage discharge from passenger ships, sewage water has a high nutrient load, which has an evident impact on the eutrophication of the Baltic Sea. Sewage contains nutrients, such as phosphorus and nitrogen, which aggravate algal blooms and other symptoms of eutrophication, one of the main environmental concerns in the Baltic Sea area. Thus, looking from an environmental protection aspect, reducing the amount of sewage discharge into the Baltic Sea is one of the measures in fighting eutrophication. Therefore, one should follow closely and analyze the effects of the implementation of the Baltic Sea Special Area regulations under MARPOL Annex IV and based on this analysis consider widening the scope of this Special Area regulation to also cover sewage discharges from cargo ships.

The following actions are proposed:

- Action 1: Carry out study and impact assessment, assessing the feasibility of cargo ships to deliver sewage to PRFs or take treatment measures, through onboard treatment plan, before discharging it into the sea
    - this work should include elements **such as**:
        - analysis of effects of the implementation of the Baltic Sea Special Area regulations under MARPOL Annex IV
        - cost-effectiveness –assessment (including assessment of economic and technical feasibility)
        - The role of port operators and the adequacy and availability of port reception facilities.
- Action 2: Take relevant action based on the outcome of Action 1, making a decision on whether to widen the scope of the Baltic Sea Special Area regulations under MARPOL Annex IV to cover also sewage discharges from cargo ships.

Activity:

Transport – shipping (incl. anchoring, mooring)

Pressure:

Input of organic matter — diffuse sources and point sources

State:

Nutrients

Extent of impact:

Compared to other sea areas, the Baltic Sea is unusually prone to eutrophication caused by input of phosphorus and nitrogen compounds. This is mainly due to its shallow water depth, large catchment area with a population of 85 million people and the slow rate of water exchange. The nutrient input stems partly from natural atmospheric and riverine input, but mostly from agriculture, municipal waste waters, fish-farms and atmospheric emissions from traffic and combustion of fossil fuels, *i.e.* nutrients from anthropogenic sources. To estimate the amount of nutrients discharged into the Baltic Sea from ships' sewage, a theoretical study was conducted in 2006 and updated in 2009 (Hänninen & Sassi 2006 and 2009).

The results show that the annual amount of sewage from ships in the Baltic Sea area could contain in total a maximum 356 tonnes of N and 119 tonnes of P. Nitrogen content of sewage produced on ferries was estimated to be 113 t, on cruise ships 113 t and on cargo ships 131 t. Phosphorous content of sewage produced on ferries was estimated to be 38 t, on cruise ships 38 t and on cargo ships 44 t. Consequently, the ship-borne nutrient load of sewage from cargo ships exceeds that of ferries and cruise ships, respectively.

Although seemingly small compared to the total nutrient load into the Baltic Sea from all sources, this amount is far from negligible and one that can be reduced effectively. The nutrients from sewage are directly available for uptake by algae. Especially the growth of blue-green algae, which is limited by the amount of phosphorus in the water, is stimulated by sewage. One must also take into account that the discharges are concentrated spatially along the shipping routes, causing serious effects locally. Therefore, the nutrients in sewage have far greater negative effects on the environment than the amount mentioned above would suggest.

Effectiveness of measure

According to the 2012 Guidelines on implementation of effluent standards and performance tests for sewage treatments plants (resolution MEPC.227(64)), the geometric mean of the total nitrogen and phosphorus content of the samples of effluent (discharged into the sea) taken during the test period should not exceed:

.1 total nitrogen1: 20 Qi/Qe mg/l or at least 70 per cent reduction;
.2 total phosphorus: 1.0 Qi/Qe mg/l or at least 80 per cent reduction.

These requirements indicate that, if the regulations currently only imposed on passenger ships would be implemented also for cargo ships, at least 70% reduction of nitrogen input and at least 80% reduction of phosphorous input would be achieved, if a cargo ship would use a sewage treatment plant on board and discharges treated sewage into the sea. Since we are lacking the data concerning nutrient load from cargo ships through sewage discharges, i.e. amount of discharges, this kind of data should be collected in Action 1 to make an adequate analysis for the basis of decision in Action 2.

If the ship does not use its sewage treatment plant or does not have such a plant on board, all sewage shall be discharged into port reception facilities. In this case all nutrient input from sewage into the sea from the ship would be eliminated.

Cost, cost-effectiveness of measure:

A ship can either use a sewage treatment plant, which fulfils the requirements given in resolution MEPC.227(64) for the Baltic Sea area, or discharge all sewage into port reception facilities.

Installation of a sewage treatment plant, which fulfils the requirements given in resolution MEPC.227(64) for the Baltic Sea area, causes some additional cost compared to a sewage treatment plant, which does not reduce nutrient input from sewage into the sea.

According to the information received from the Baltic Sea States, port reception facilities for sewage from passenger ships are already available in passenger ports. The number of crew members in cargo ships range from about 10 to 30 persons. Thus, the amount of sewage from an individual cargo ship is much smaller than the amount of sewage from a passenger ship, which may have 1000 to 3000, even up to 5000 passengers and additional crew members on board. Consequently, tank trucks can be used as port reception facilities in all ports in the Baltic Sea area. Such tank trucks are already available and delivery of sewage is included in the NSF-system in the Baltic ports meaning that there will be no extra costs for cargo ships.

As part of the proposed Action 1, a cost-effectiveness assessment will be carried out to find out the exact economic impact for shipping companies and ports as well as further assess the technical feasibility of delivering sewage to PRFs or using a treatment plant prior to discharging into the sea.

Feasibility:

It would be feasible to have the same sewage discharge requirements for all ships sailing in the Baltic Sea area. Knowledge and analysis from the existing regulation concerning passenger ships could be used to analyse the feasibility for cargo ships as well.

Follow-up of measure:

Action 1 is to be followed by Action 2 which will be further formulated once results from Action 1 are available.

Background material:

MEPC 60/6/2, Proposal to amend MARPOL Annex IV to include the possibility to establish Special Areas for the prevention of pollution by sewage and to designate the Baltic Sea as a Special Area under Annex IV, submitted by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, the Russian Federation and Sweden

MEPC 60/INF.4, Information on the proposal to designate the Baltic Sea as a Special Area under MARPOL Annex IV, submitted by Denmark, Estonia, Finland, Germany, Lithuania, Latvia, Poland, the Russian Federation and Sweden

References

HELCOM Maritime 19 document 3-6, Proposal for amendments to the BSAP, submitted by Finland.

HELCOM Maritime 19 document 13-4, Discharges to the sea from Baltic Sea shipping in 2006 – 2018, submitted by Finland.

Hänninen, S. and Sassi, J. 2006. Estimated nutrient load from waste waters originating from ships in the Baltic Sea area – updated 2009. VTT Research Report VTT-R-07396-08, see http://www.vtt.fi/inf/julkaisut/muut/2009/VTT_R_07396_08.pdf

Article 3 paragraph 2 of the Helsinki Convention

Actions to reduce harmful impact of grey water discharges from Baltic Sea shipping

Submitted by:

Finland

Description of measure

The Baltic Sea was the first sea area in the world to receive the status as a special area in MARPOL Annex IV (sewage) in 2016. Set to come into effect 1 June 2019 for new passenger ships, 1 June 2021 for existing passenger ships and in June 2023 for passenger ships entering the Baltic Sea in direct passage to the Russian ports in the eastern Gulf of Finland, passenger ships, including cruise ships, will have to discharge sewage into port reception facilities or alternatively at sea only after treatment with very advanced on-board sewage treatment plants able to reduce nutrient input into the sea.

Annex IV of the MARPOL Convention sets ambitious standards for sewage discharges, but discharges of grey water into the sea is not regulated at all. The next regulatory challenge for vulnerable sea areas, like the Baltic Sea, will most likely be the treatment of grey water to the same standard as black water, and HELCOM should address this challenge.

The following actions are proposed to be included in the roadmap to consider the issue:

- Action 1: Carry out study and impact assessment, assessing the possibilities of ships to deliver grey water to PRFs or take treatment measures, through onboard treatment plant, before discharging it into the sea
    - this work should include elements **such as**:
        - analysis of effects of the implementation of the Baltic Sea Special Area regulations under MARPOL Annex IV
        - cost-effectiveness –assessment (including assessment of economic and technical feasibility)
        - The role of port operators and the adequacy and availability of port reception facilities.
- Action 2: Take relevant action based on the outcome of Action 1, making a decision on whether to widen the scope of the Baltic Sea Special Area regulations under MARPOL Annex IV to cover also grey water discharges from ships.

Activity:

Transport – shipping (incl. anchoring, mooring)

Pressure:

Input of organic matter — diffuse sources and point sources

State:

Nutrients

Extent of impact:

According to recent information given in HELCOM Maritime 19 document 13-4, grey water discharges from Baltic Sea shipping was estimated to be 5.4 million cubic meters. Passenger ships are responsible for almost 89% of grey water discharges. Since food waste is very often mixed with grey water from

ships' galleys and discharged into the sea, it is anticipated that grey water also has a high nutrient content.

Effectiveness of measure

According to the 2012 Guidelines on implementation of effluent standards and performance tests for sewage treatments plants (resolution MEPC.227(64)), the geometric mean of the total nitrogen and phosphorus content of the samples of effluent (discharged into the sea) taken during the test period should not exceed:

.1 total nitrogen1: 20 Qi/Qe mg/l or at least 70 per cent reduction;
.2 total phosphorus: 1.0 Qi/Qe mg/l or at least 80 per cent reduction.

These requirements indicate that, if the regulations currently only imposed on sewage discharges from passenger ships would be implemented also for grey water discharges from ships, at least 70% reduction of nitrogen input and at least 80% reduction of phosphorous input would be achieved, if a ship would use a sewage treatment plant on board and discharges treated grey water into the sea.

If the ship does not use its sewage treatment plant or does not have such a plant on board, all grey water shall be discharged into port reception facilities. In this case all nutrient input from grey water into the sea from the ship would be eliminated.

Cost, cost-effectiveness of measure:

A ship can either use a sewage treatment plant, which fulfils the requirements given in resolution MEPC.227(64) for the Baltic Sea area, or discharge all grey water into port reception facilities.

Installation of a sewage treatment plant, which fulfils the requirements given in resolution MEPC.227(64) for the Baltic Sea area, causes some additional cost compared to a sewage treatment plant, which does not reduce nutrient input from sewage into the sea.

According to the information received from the Baltic Sea States, port reception facilities for sewage from passenger ships are already available in passenger ports. These port reception facilities can also be used as port reception facilities for grey water from passenger ships. Tank trucks can be used as port reception facilities in all ports in the Baltic Sea area as port reception facilities for discharges of grey water. Consequently, these new regulations would have a minimum additional cost for shipping in the Baltic Sea area.

Feasibility:

It would be feasible to have the same discharge requirements for sewage and grey water for all ships sailing in the Baltic Sea area. Therefore, there are clear reasons to impose discharge regulations for discharge of grey water from ships.

Follow-up of measure:

To be agreed later.

Background material:

MEPC 60/6/2, Proposal to amend MARPOL Annex IV to include the possibility to establish Special Areas for the prevention of pollution by sewage and to designate the Baltic Sea as a Special Area under Annex IV, submitted by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, the Russian Federation and Sweden

MEPC 60/INF.4, Information on the proposal to designate the Baltic Sea as a Special Area under MARPOL Annex IV, submitted by Denmark, Estonia, Finland, Germany, Lithuania, Latvia, Poland, the Russian Federation and Sweden

References

HELCOM Maritime 19 document 3-6, Proposal for amendments to the BSAP, submitted by Finland.

HELCOM Maritime 19 document 13-4, Discharges to the sea from Baltic Sea shipping in 2006 – 2018, submitted by Finland.

Hänninen, S. and Sassi, J. 2009. Estimated nutrient load from waste waters originating from ships in the Baltic Sea area – updated 2009. VTT Research Report VTT-R-07396-08, see http://www.vtt.fi/inf/julkaisut/muut/2009/VTT_R_07396_08.pdf

Develop a road map to investigate underwater noise, including possible follow-up actions

Submitted by:

Finland

Description of measure

Underwater noise is a very timely issue both at regional level in the Baltic Sea area, and at global level at IMO. Thus, the HELCOM contracting parties should actively contribute to work at IMO with a Baltic Sea -oriented approach. Anthropogenic underwater noise as an environmental issue has been gathering increasing attention in recent years. Scientific evidence suggests multiple detrimental impacts to marine fauna from both impulsive (e.g. pile driving, explosions) and continuous (e.g. shipping) sources. Global research, however, has been focusing more on oceanic environments and accordingly, all the results might not be directly compatible to the Baltic Sea.

There is thus a need for more research to increase the understanding of underwater noise and its impacts on marine biodiversity, specifically in the Baltic Sea. Based on this area-specific scientific knowledge a decision on follow-up actions can be made. Due to the difference in the nature of commercial shipping and recreational boating, it is reasonable to consider differentiated actions for them. Bearing in mind the main principles of environmental protection, concrete action can and should be taken swiftly, once it is seen justified. Therefore, if adequate scientific reasoning and impact assessment is available, decisions on concrete actions in steps 2 and 3 could be made irrespectively from each other.

The following actions are proposed to be included in the roadmap to consider the issue (see chapter “Extent of Impact” for further concretization and elaboration).

- **Action 1**: carry out research and impact assessment, assessing the impact of underwater noise on Baltic marine biodiversity.

- **Action 2**: take relevant action based on the outcome of action 1, making a decision on what measures should possibly be taken to reduce the impact of underwater noise introduced by commercial vessels.

- **Action 3**: take relevant action based on the outcome of action 1, making a decision on whether measures should be developed to reduce the impact of underwater noise introduced by recreational boating.

Activity:

Transport – shipping (incl. anchoring, mooring)
Tourism and leisure activities (boating, beach use, water sports, etc.)

Pressure:

Input of anthropogenic sound (impulsive, continuous)

State:

Noise

Extent of impact:

Anthropogenic underwater noise has been formally recognized as a pollutant to the marine environment (IISD 2018), originating from human activities such as shipping or underwater construction. Although the issue has been recognized, there is currently no binding international regulation in force. One of the ways to promote the need for further research is to raise the awareness of policy makers, stakeholders and the general public of this relatively new and still poorly known pressure to the marine environment. The International Maritime Organization (IMO) released a non-mandatory guideline in 2014 for reducing noise from ships (MEPC.1/Circ.833). Canada has been active in the recent IMO´s MEPC-meetings in advancing the international effort to reduce the impacts of underwater noise from shipping. The issue of underwater noise will be included in the agenda of the future sessions of the Marine Environment Protection Committee (MEPC) where possible international actions or regulations will be discussed.

Underwater noise has been proven to have detrimental effects on multiple marine species. The global research, however, has been focusing more on oceanic environments and marine mammals (Williams et al. 2015). Due to differences in the oceanographic features and species composition, the results of the research may not be directly applicable to the Baltic Sea.

The Baltic Sea, with high shipping activity and dense coastal human population, has multiple sources of anthropogenic underwater noise. Scientific research available in the BSR indicates the extensive effects of underwater noise on marine environment (research by i.e. the BIAS-project). Shipping activity has clear contribution to background noise levels in many areas at the Baltic Sea (Mustonen et al. 2019). However, further research is needed to devise applicable and efficient mitigation measures based on the best practices available. There are many species likely to be impacted by noise (HELCOM 2019). The increasing amount of research can also be utilized when defining the future actions at the upcoming Marine Environment Protection Committee (MEPC) meetings of IMO.

In some areas of the Baltic Sea the high density of recreational boats results in regionally and seasonally high noise pressure on marine ecosystems. The greatest impacts from underwater noise will occur in areas where there is most overlap between shipping and marine species sensitive to underwater noise. Threshold values for noise from shipping and boating still need to be developed.

Examples of what issues the proposed actions could, inter alia, cover:

- **Action 1**: carry out research and impact assessment, assessing the impact of underwater noise on Baltic marine biodiversity. This work should include elements such as:

A) further investigation on the role of commercial vessels in introducing underwater noise, actively contributing to work at IMO with a Baltic Sea -oriented approach
B) the role of recreational boating in introducing underwater noise in the Baltic Sea
C) ways to establish long-term monitoring of underwater noise in the Baltic Sea
D) cost-effectiveness-assessment

- **Action 2**: take relevant action based on the outcome of action 1, making a decision on what measures should possibly be taken to reduce the impact of underwater noise introduced by commercial vessels. Possible actions to take could include elements such as:
  A) further design of propellers
  B) studies on vessel slowdown and impact on the logistic chain
  C) active contribution to development of IMO instruments

- **Action 3**: take relevant action based on the outcome of action 1, making a decision on whether measures should be developed to reduce underwater noise introduced by recreational boating. Possible actions to take could include elements such as:
  A) studies on boat slowdown
  B) development of technology (propulsion, sonars to operate at an optimal frequency etc.
  C) mapping of ecologically sensitive areas with spatial and temporal aspects (e.g. spawning areas and spawning periods) to be established as slow-down areas or areas with (temporal) limitations for entry.

Some elements of actions 2 and 3 could overlap with studies in action 1.

Effectiveness of measure

The increased amount of research and possible according actions enhance the understanding of the impacts of anthropogenic underwater noise, which enables both the mitigation of these impacts and assessment of the mitigation measures. Contribution of the Baltic Sea states to the discussions at the IMO ensures the unique characteristics of the Baltic Sea to be noted in the future discussions.

Cost, cost-effectiveness of measure:

N/A

Feasibility:

N/A

Follow-up of measure:

Action 1 to be followed by actions 2 and 3. Possible temporal overlap in the implementation of action 1 and actions 2/3 starting some elements of actions 2 and 3 before completing action 1 entirely.

Background material:

MEPC.1/Circ.833, Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life

MEPC 73/INF.23, Scientific support for underwater noise effects on marine species and the importance of mitigation, submitted by Canada

MEPC 74/17/2, Advancing international collaboration for quiet ship design and technologies to protect the marine environment, submitted by Canada and France.

References

HELCOM (2019). Noise sensitivity of animals in the Baltic Sea. *Baltic Sea Environment Proceedings* N° 167

International Institute for Sustainable Development (2018). Nineteenth Meeting of the United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea: 18-22 June 2018. *Earth Negotiations Bulletin* 25: 158. http://enb.iisd.org/download/pdf/enb25158e.pdf

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Williams, R., A. J. Wright, E. Ashe, L. K. Blight, R. Bruintjes, R. Canessa, C. W. Clark, S. Cullis-Suzuki, D. T. Dakin, C. Erbe, et al. (2015). Impacts of anthropogenic noise on marine life: Publication patterns, new discoveries, and future directions in research and management. *Ocean & Coastal Management* 115: 17–24.

Title

19. Limit the discharge of cargo residues from shipping in the Baltic Sea (e.g. vegetable oil and fertilizers)

Submitted by:

Swedish Agency for Marine and Water Management

Description of measure

Discharges from shipping of cargo residues, discharges limited in volume or classified as non-harmful to the marine environment, can still negatively affect the sensitive Baltic Sea ecosystem.

Liquid bulk (other than mineral oil)
According to MARPOL Annex II and the IBC code (International Bulk Chemical Code) it is allowed to discharge cargo residues under certain conditions and depending on the liquid substance that was previously transported. The ship needs to be under way, >12nm from land and the water depth more than 25m. The volume that can be discharged into the ocean depends on the substance that was carried and the construction year of the ship.

Dry bulk
Cargo residues in washwater from dry bulk is allowed to be discharged en route and >12 nm from land, if the cargo was not classified as harmful to the marine environment according to MARPOL Annex V. In the IMSBC-code several ammonium nitrates are classified as harmful to the marine environment. The responsibility for the classification of the cargo lies at the dispatcher of the gods.

Hence, some restrictions are in place that limits the potential environmental effects of these approved discharges of tank residues. However, the discharges still contribute to detrimental effects in the Baltic Sea, e.g. fertilizers or components of fertilisers classified as non-harmful to the marine environment contributes to eutrophication effects and vegetable oils cause lethal effects on sea-birds.
Sea-bird and especially the long-tailed duck (*Clangula hyemalis*) is affected by various chemical spills, during its wintering at for example Hoburgs bank, south of the island of Gotland. Large numbers (<1k) of oil damaged sea-birds has been found on beaches when no mineral oil spill was reported by the HELCOM CEPCO flights (Larsson 2019). During 2018 the Swedish coast guard reported 27 spills of other substances besides mineral oil (Larsson 2019). HELCOM reported during 2018 23 spills of other substances and 70 spills of unknown substance (HELCOM 2019). These reports of unknown substance or of other substances besides mineral oil could be a result of discharge of cargo residues of e.g. vegetable oil. About five million tons of liquid bulk, other than mineral oil, is annually handled in Swedish ports. Product tankers designed for carrying cargo other than mineral oil is often in the size between 3000 – 30 000 dwt. Hence, a large number of voyages are performed each year for transporting this liquid bulk, and consequently potential discharges of cargo residues (Hermansson & Hassellöv 2020).
The Baltic Sea is still severely affected by eutrophication and large areas of the Baltic proper is subjected to anoxia and hypoxia (~24 % resp. ~33 %) (SMHI 2019). Studies show that one dry bulk carrier can release 15-25 ton solid cargo residues from one washing. Assuming 60-100 ton cargo slurry per hold after washings, five holds per ship and 5 % solids in the washwater (Grote el al., 2016). If fertilizer or components of fertilizers classified as non-harmful to the marine environment often is shipped, and these volumes are commonly discharged, this can contribute to the overall P and N load to the Baltic Sea.

The volumes of discharges of harmful cargo residues into the Baltic Sea should therefore be estimated and evaluated. In a second stage, if additional data supports the assessment, the discharges should be limited as far as possible in the sensitive and already highly anthropogenically affected Baltic Sea. Appropriate reception facilities should be available to receive the increased volumes of cargo residues.

Activity:

Transport – shipping (incl. anchoring, mooring)

Pressure:
Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events
Input of nitrogen
Input of phosphorous

State:
Birds
Seabed habitats
Pelagic habitats

Extent of impact:
Discharges of cargo residues into the Baltic Sea can for example affect sea-birds and contribute to the overall eutrophication situation.

Effectiveness of measure
Limiting the discharges of cargo residues can reduce negative environmental effects on sea-birds and of eutrophication.

Cost, cost-effectiveness of measure:
Reduced eutrophication and less sea-birds affected by oil leads to a healthier Baltic Sea, would increase the ecosystem services it provides.
Decreased volumes of cargo residues generates larger volumes that needs to be handled by ports and port reception facilities. This probably leads to increased costs.

Feasibility:
[*Optional: provide views on feasibility of implementing the actions e.g. technical, economic, social*]

Follow-up of measure:
Increased volumes of handled cargo residues in port reception facilities.

Background material:
[*Free text: Clarify choice of background material for the synopses, e.g. does it represent a comprehensive overview of results with regard to the measure or a sub-selection*]

References
Grote, M., Mazureka, N., Gräbscha, C,. Zeilingerb, J., Le Flochc, S., Wahrendor, D-S., Höfera, T. 2016. Dry bulk cargo shipping — An overlooked threat to the marine environment? Dry bulk cargo shipping — An overlooked threat to the marine environment? Marine Pollution Bulletin. 1:511-519.

HELCOM. 2019. Annual report on discharges observed during aerial surveillance in the Baltic Sea 2018.

Hermansson A.L., Hassellöv I-M. 2019. Tankrengöring och dess påverkan på havsmiljön (Tank cleaning and its impact on the marine environment). Chalmers University of Technology.

IMO – MARPOL, Annex II

IMO – MARPOL, Annex V

Larsson, K. 2019. Oljeutsläpp i Sveriges närområde (Oil spills in Sweden's territorial and EEZ area). Sjöfartshögskolan, Linnéuniversitetet.

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